CHI

EXD

RESEARCH STUDIES
OF THE
STATE COLLEGE OF WASHINGTON

Volume XXI Number 1
March, 1953

CONTENTS

PAGE

THE SUKSDORF FUNGUS COLLECTIONS, PART II,
Wm. Bridge Cooke and Charles Gardner Shaw 3

EVIDENCE OF COMPLEX PHYSIOLOGICAL
HETEROTHALLISM IN *Ustilago Striiformis Hordei*,
George W. Fischer 57

State College of Washington
Pullman, Washington

COMMONWEALTH MYCOLOGICAL INSTITUTE
14 DEC 1953

RESEARCH STUDIES

of the

STATE COLLEGE OF WASHINGTON

EDITOR

PAUL BECKETT*
Associate Professor of Public Administration

ACTING EDITOR

HOWARD C. PAYNE
Assistant Professor of History

ASSOCIATE EDITORS

WALLIS BEASLEY
Associate Professor of Sociology

CHARLES D. CAMPBELL
Professor of Geology

FRED A. DUDLEY
Professor of English

ADOLPH HECHT
Associate Professor of Botany

Entered as second-class matter December 26, 1936, at the post office at Pullman, Washington, under the Act of August 24, 1912.

Research Studies of the State College of Washington is published in Pullman, Washington, by the State College of Washington. It is issued four times a year—in March, June, September, and December.

PURPOSE. *Research Studies* is a medium of publication for articles of research in the pure sciences and arts. Its pages are open to the faculty and advanced students of the State College of Washington. One issue each year is devoted to papers read by members of the Pacific Sociological Society at its annual convention. Suitable articles by other persons are accepted whenever space is available.

MANUSCRIPTS. Submit manuscripts to Howard C. Payne, Room 429, Todd Hall, Pullman, Washington. Though no strict limit is set as to the maximum number of pages or the nature or number of illustrations, authors are reminded that the papers must be actual research, and that conciseness is desirable. Authors who will assume the expense may arrange for the inclusion of extra pages, tables, or illustrations.

SUBSCRIPTIONS. *Research Studies* will be mailed postpaid to subscribers for three dollars a year. Subscriptions are payable in advance to *Research Studies*, the State College of Washington, Pullman, Washington, U.S.A.

EXCHANGE. *Research Studies* is offered in exchange to other colleges, universities, learned societies, and libraries. Publications sent in return should be addressed to the Exchange Department, Library, the State College of Washington, Pullman, Washington, U.S.A. At present, all back numbers and title pages can still be supplied.

SINGLE NUMBERS. Single numbers will be sold or exchanged as long as available; orders should be addressed to *Research Studies*, the State College of Washington, Pullman, Washington, U.S.A. For prices of back numbers (with the list of articles of each number), see pages 63-64 of the March, 1951, issue (Vol. XIX, No. 1). The price of the present number is one dollar.

* On leave, 1951-53.

RESEARCH STUDIES of the STATE COLLEGE OF WASHINGTON

Volume XXI March, 1953 Number 1

THE SUKSDORF FUNGUS COLLECTIONS

WM. BRIDGE COOKE[1] and CHARLES GARDNER SHAW[2]

(Continued from Volume XX, Number 4)

SPECIMENS COLLECTED BY SUKSDORF AND DISTRIBUTED AS FUNGI EXSICCATI

A number of specimens collected by Suksdorf have been distributed by Ellis, Bartholomew, Sydow, and Vestergren. By checking through sets of *fungi exsiccati* in the Mycological Collections, Bureau of Plant Industry, and at the New York Botanical Garden, some of these specimens were found. Those distributed by Elam Bartholomew in North American Uredinales were presumably obtained through E. W. D. Holway. These numbers were obtained by checking the Holway Herbarium through the kindness of Gerald Ownbey, Curator of the Herbarium, Department of Botany, University of Minnesota. The following list of such distributions is as complete as could be obtained.

Ellis and Everhart. North American Fungi.

1271. *Peziza scabrovillosa* Phill. [=*Dasyschypha scabrovillosa* (Phill.) Sacc.] on *Rubus nutkanus* (=*Rubus parviflorus*). Wash. Ter. Aug. 1883.

1281(b). *Stictis hysterina* Fr. on *Abies* sp. Mt. Paddo, Wash. Ter.

1364. *Phoma lupini* Ell. & Ev. on *Lupinus* sp. Falcon Valley. July 1883.

1373. *Excipula conglutinata* Ell. & Ev. [=*Heteropatella conglutinata* (Ell. & Ev.) Nannf.] on *Valeriana capitata* (=*Valeriana sitchensis*). Mt. Adams. Sept. 1883.

---

[1] Formerly Research Associate in Plant Pathology, Department of Plant Pathology, State College of Washington. Now, Mycologist, Bacteriology Division, Environmental Health Center, Cincinnati, Ohio.

[2] Associate Professor and Associate Plant Pathologist, Department of Plant Pathology, State College of Washington.

1431. *Aecidium album* Clint. [=*Uromyces fabae* (Pers.) de Bary] on *Vicia americana.* Falcon Valley. June 1883.
1441. *Uromyces orobi* (Pers.) Lév. (=*Uromyces lupini* Pers.) on *Lupinus polyphyllus.* Falcon Valley. July 1883.
1448. *Puccinia jonesii* Pk. on *Peucedanum suksdorfii* (=*Lomatium suksdorfii*). Klickitat Co. Nov. 1883.
1449. *Puccinia angelicae* Ell. & Ev. (=*Puccinia ellisii* de Toni) on *Angelica genuflexa.* Falcon Valley. Aug. 1883.
1451. *Puccinia mirabilissima* Pk. [=*Cumminsiella mirabilissima* (Pk.) Nannf.] on *Berberis aquifolium.* Falcon Valley. June 1883.
1452. *Puccinia troximontis* Pk. [=*Puccinia hieracii* (Schum.) Mart.] on *Troximon gracilens* (=*Hieracium gracile*). Mt. Adams. June 1883.
1463. *Puccinia congregata* Ell. & Harkn. [=*Puccinia heucherae* (Schw.) Diet.] on *Heuchera cylindrica.* Falcon Valley. July 1883.
1658. *Leptosphaeria hysterioides* Ell. & Ev. on *Xerophyllum tenax.* Mt. Adams. Sept. 1883.
1831. *Aecidium giliae* Pk. (=*Puccinia plumbaria* Pk.) on *Gilia gracilis* (=*Phlox gracilis*). Falcon Valley. May 1886.
1833. *Puccinia balsamorhizae* Pk. on *Balsamorhiza deltoidea.* Falcon Valley. Aug. 1883.
1834. *Puccinia aberrans* Pk. [=*Puccinia holboellii* (Hornem.) Rostr.] on *Arabis lyallii.* Mt. Adams. Aug. 1885.
1840. *Puccinia subcircinata* Ell. & Ev. on *Senecio triangularis.* Mt. Adams. Aug. 1885.
1856. *Puccinia jonesii* Pk. on *Peucedanum suksdorfii* (=*Lomatium suksdorfii*). West. Klickitat Co. May 1884.
1875. *Uromyces trifolii* DC. (=*Uromyces minor* Schroet.) on *Trifolium repens* (Error for *Trifolium* sp.) Wash. Ter. May 1882.
2040. *Peziza setigera* Phill. [=*Trichopeziza setigera* (Phill.) Sacc.] on *Veratrum* sp. Mt. Adams. Sept. 1885.
2062. *Hysterium formosum* Cke. [=*Hysterographium formosum* (Cke.) Sacc.] on *Pinus albicaulis.* Mt. Adams. Aug. 1885.
2171. *Sphaeronema sphaeroideum* Ell. on *Arabis lyallii.* Mt. Adams. Aug. 1884.

3107. *Lasiobotrys lonicerae* Kze. & Schm. on *Lonicera* sp. White Salmon River.
3120. *Linospora brunellae* Ell. & Ev. n. sp. on *Prunella vulgaris.* Columbia River. Apr. 1886.
3130. *Hypoderma tunicatum* Ell. & Ev. n. sp. on *Arctostaphylos nevadensis.* Mt. Paddo. July 1884.
3136. *Entyloma arnicale* Ell. & Ev. [=*Entyloma calendulae* (Oud.) de Bary] on *Arnica chamissonis.* Mts., Skamania Co. Aug. 1886.
3137. *Uromyces sisyrinchii* Mont. (=*Uromyces probus* Arth.) on *Sisyrinchium grandiflorum* (=*Sisyrinchium douglasii*). Columbia River. July 1893.
3328. Same as 3120.
3419. *Sphaerotheca fuscata* (B. & C.) Ell. & Ev. [=*Sphaerotheca macularis* (Wallr. ex Fr.) W. B. Cooke] on *Bidens frondosa.* Klickitat Co. Nov. 1894.
3517. *Microsphaera russellii* Clint. on *Oxalis suksdorfii.* Bingen. Aug. 1884.

Sydow. Uredineen.

1060. *Puccinia asarina* Kze. on *Asarum caudatum.*
1063. *Puccinia clarkiae* Pk. (=*Puccinia oenotherae* Vize) on *Godetia epilobioides.*
1064. Same as 1063.
1860. *Uromyces suksdorfii* Diet. & Holw. on *Silene oregana.*
2038. *Puccinia scandica* Johans. on *Epilobium clavatum.*

Vestergren. Micromycetes rariores selecti.

980. *Puccinia scandica* Johans. on *Epilobium clavatum.* (From the same collection as Sydow, Uredineen ♯2038.)

Ellis and Everhart. Fungi Columbiani.

504. *Sphaerotheca castagnei* Lév. [=*Sphaerotheca macularis* (Wallr. ex Fr.) W. B. Cooke] on *Bidens frondosa.* Columbia River. Sept. 1898.
505. *Erysiphe graminis* DC. on *Triticum vulgare* (=*Triticum aestivum*). Klickitat Co. June 1886.
507. *Microsphaera russellii* Clint. on *Oxalis suksdorfii.* Bingen. Sept. 1893.
510. *Lasiobotrys lonicerae* (Fr.) Kze. on *Lonicera* sp. White Salmon.

540. *Entyloma arnicale* Ell. & Ev. [=*Entyloma calendulae* (Oud.) de Bary] on *Arnica chamissonis*. Chiquash Mts. Aug. 1886.
546. *Uromyces sisyrinchii* Mont. (=*Uromyces probus* Arth.) on *Sisyrinchium grandiflorum* (=*Sisyrinchium douglasii*). Columbia River. July 1893.
555. *Calyptospora geoppertiana* Kühn [=*Pucciniastrum geoppertianum* (Kühn) Kleb.] on *Vaccinium myrtilloides* (=*Vaccinium membranaceum*). Chiquash Mts. Aug. 1886.
1030. *Sphaerotheca fuscata* (B. & C.) Ell. & Ev. [=*Sphaerotheca macularis* (Wallr. ex Fr.) W. B. Cooke] on *Bidens frondosa*. West. Klickitat Co. Nov. 1898.
(Note: A number of specimens previously issued in North American Fungi were reissued in Fungi Columbiani. Apparently the stock was not completely used up in the first distribution.)

Elam Bartholomew. Ellis and Everhart's Fungi Columbiani.

1795. *Uromyces gnaphalii* Ell. & Ev. (=*Uromyces amoenus* Syd.) on *Anaphalis margaritacea*. September 9, 1902.

Elam Bartholomew. North American Uredinales.

18. *Puccinia alliorum* (DC.) Corda (=*Puccinia blasdalei* Diet. & Holw. in Diet.) on *Allium acuminatum*. June 2, 1894.
43. *Puccinia iridis* (DC.) Wallr. on *Iris missouriensis*. September 21, 1894.
48. *Puccinia mesomajalis* B. & C. on *Clintonia uniflora*. June 7, 1894.
54. *Puccinia plumbaria* Pk. on *Phlox douglasii*. August 31, 1894.
128. *Puccinia chelonis* Diet. & Holw. on *Chelone nemorosa* (=*Pentstemon nemorosus*). August 27, 1895.
132. *Puccinia cirsii* Lasch on *Cirsium remotifolium*. October 3, 1894.
133. *Puccinia mariae-wilsoniae* Clint. on *Montia asarifolia* (=*Claytonia cordifolia*). August 10, 1886.
139. *Puccinia dichelostemmae* Diet. & Holw. on *Brodiaea congesta* (=*Brodiaea puchella*). April 5, 1894.
159. *Puccinia oenotherae* Vize on *Clarkia rhomboidea*. May 5, 1894.
166. *Puccinia punctata* Lk. on *Galium triflorum*. September 14, 1894.

202. *Aecidium collinsiae* Ell. & Ev. (=*Puccinia collinsiae* [Ell. & Ev.] P. Henn.) on *Collinsia tenella.* June 23, 1893.
221. *Puccinia absinthii* (Hedw. f.) DC. on *Artemisia dracunculoides.* September 16, 1893.
224. *Puccinia bistortae* (Str.) DC. on *Polygonum bistortoides.* June 24, 1893.
242. *Puccinia hieracii* (Schum.) Mart. on *Hieracium canadense.* August 6, 1893.
246. *Puccinia menthae* Pers. on *Mentha canadensis.* July 22, 1893.
254. *Puccinia plumbaria* Pk. on *Gilia gracilis* (=*Phlox gracilis*). June 24, 1893.
298. *Uromyces proëminens* (DC.) Pass. on *Euphorbia serpyllifolia.* September 20, 1893.
301. *Aecidium collinsiae* Ell. & Ev. (=*Puccinia collinsiae* [Ell. & Ev.] P. Henn.) on *Tonella collinsioides* (=*Tonella tenella*). April 20, 1894.
360. *Puccinia plumbaria* Pk. on *Gilia gracilis* (=*Phlox gracilis*). June 23, 1893.
436. *Puccinia epilobii-tetragoni* (DC.) Wint. [=*Puccinia veratri* (DC.) Duby] on *Epilobium paniculatum.* June 23, 1893.
438. *Puccinia gayophyti* (Billings) Pk. [=*Puccinia vagans* (DC.) Arth.] on *Gayophytum* sp. June 1893.
453. *Puccinia hemizoniae* Ell. & Tr. (=*Puccinia nuda* Ell. & Ev.) on *Lagophylla ramosissima.* August 26, 1893.
454. *Puccinia heucherae* (Schw.) Diet. on *Saxifraga fragosa.* December 31, 1893.
468. *Puccinia sejuncta* Syd. [=*Puccinia hieracii* (Schum.) Mart.] on *Hieracium albiflorum.* June 23, 1893.
506. *Earlea bilocularis* (Diet. & Holw.) Arth. (=*Phragmidium biloculare* Diet. & Holw.) on *Potentilla flabellifolia.* August 15, 1897.
532. *Puccinia bistortae* (Str.) DC. on *Polygonum newberryi.* August 10, 1886.
533. *Puccinia calochorti* Pk. on *Calochortus longebarbatus.* June 12, 1902.
540. *Puccinia crepidis-acuminatae* Syd. [=*Puccinia hieracii* (Schum.) Mart.] on *Crepis acuminata.* May 27, 1884.
554. *Puccinia ortonii* Jacks. on *Dodecatheon* sp. August 13, 1886.

574. *Puccinia symphoricarpi* Harkn. on *Symphoricarpos racemosus* (=*Symphoricarpos albus*). Sept. 1884.
577. *Puccinia veratri* Duby on *Veratrum californicum.* July 14, 1886.
619. *Puccinia aspera* Diet. & Holw. (=*Puccinia pazschkei* Diet.) on *Saxifraga mertensiana.* August 14, 1897.
622. *Puccinia calochorti* Pk. on *Calochortus elegans* (Error for *C. lobbii*). July 14, 1886.
640. *Puccinia heucherae* (Schw.) Diet. on *Mitella breweri.* August 28, 1895.
672. *Puccinia violae* (Schum.) DC. on *Viola glabella.* July 31, 1895.
676. *Pucciniastrum myrtillii* (Schum.) Arth. on *Vaccinium caespitosum.* July 30, 1885.
684. *Uromyces fabae* (Pers.) de Bary on *Lathyrus palustris* (=*Lathyrus lanszwertii*). August 8, 1886.
689. *Uromyces junci-effusi* Syd. on *Juncus orthophyllus.* September 11, 1883.
690. *Uromyces lupini* B. & C. on *Lupinus polyphyllus.* July 20, 1886.
691. *Uromyces lupini* B. & C. on *Lupinus polyphyllus.* July 20, 1890.
721. *Phragmidium ivesiae* Syd. on *Potentilla flabelliformis.* June 29, 1884.
731. *Puccinia caricis-asteris* Arth. [=*Puccinia extensicola* Plowr. var. *asteris* (Thuem.) Arth.] on *Aster ledophyllus.* September 10, 1902.
745. *Puccinia heucherae* (Schw.) Diet. on *Tiarella unifoliata.* September 16, 1902.
752. *Puccinia micromeriae* Dudl. & Thomps. (=*Puccinia menthae* Pers.) on *Micromeria chamissonis* (=*Satureja douglasii*). June 21, 1894.
770. *Puccinia urticae* (Schum.) Lagerh. [=*Puccinia caricis* (Schum.) Schroet.] on *Carex utriculata* (=*Carex rostrata*). September 2, 1886.
789. *Uromyces heterodermus* (Schw.) Diet. on *Erythronium montanum.* August 26, 1895.
1060. *Puccinia madiae* Diet. & Holw. (=*Puccinia nuda* Ell. & Ev.) on *Madia sativa.* June 28, 1900.

1387. *Uromyces holwayi* Lagerh. on *Lilium columbianum.* September 1, 1898.

1389. *Uromyces intricatus* Cke. on *Eriogonum compositum.* August 3, 1900.

1438. *Puccinia effusa* Diet. & Holw. on *Viola nuttallii* (=*Viola praemorsa*). May 19, 1897.

1457. *Puccinia ortonii* Jacks. on *Dodecatheon* sp. August 31, 1886.

1523. *Puccinia areolata* Diet. & Holw. on *Caltha biflora.* September 9, 1897.

1525. *Puccinia asarina* Kze. on *Asarum caudatum.* August 12, 1896.

1532. *Puccinia blasdalei* Diet. & Holw. on *Allium acuminatum.* April 18, 1901.

1541. *Puccinia dichelostemmae* Diet. & Holw. on *Brodiaea congesta* (=*Brodiaea puchella*). March 20, 1900.

1574. *Puccinia violae* (Schum.) DC. on *Viola glabella.* July 19, 1897.

1595. *Uromyces junci-effusi* Syd. on *Juncus ensifolius.* September 17, 1901.

1650. *Puccinia giliae* Ell. & Harkn. on *Collomia grandiflora.* July 10, 1900.

Systematic List of Suksdorf Fungi

The following list of species has been drawn up from specimens in the Suksdorf collection at Pullman, in the Burt Herbarium at the Farlow Herbarium, and in the Lloyd Collections at the Bureau of Plant Industry. It also includes the records contained in Suksdorf's correspondence; records which are not confirmed by specimens are credited to the mycologist who made the report. With each species the habitat, and county or counties in Washington where the fungus was found are indicated. In cases where the specimens were collected in Oregon, California, or Montana, the name of the state also appears.

MYXOMYCETES

See Cooke, W. B. Some Myxomycetes from South Central Washington. Northwest Science 25, No. 4. 1951. Species on identifiable substrata are included in the Host Index of the present paper.

PHYCOMYCETES

Chytridiales

CHYTRIDIACEAE

Urophlyctis pluriannulata (B. & C.) Farl. on *Ligusticum grayi,* Yakima Co.; *Sanicula menziesii,* Klickitat Co.

In addition, Holway reported receipt of a specimen of:

Physoderma eleocharidis (Fckl.) Schroet. on *Eleocharis* sp., no location given.

Two species of *Synchytrium* were reported by Ellis. Neither of the names Ellis used was ever published. These were:

"*Synchytrium perforatum* Ell. & Ev." *on Valeriana sitchensis,* Yakima Co.

"*Synchytrium polemonii* Ell. & Ev." on *Polemonium occidentale,* Yakima Co.

Peronosporales

ALBUGINACEAE

Albugo sp. on *Eriogonum elatum,* Klickitat Co.

Albugo blitii (Biv.) Kze. on *Amaranthus graecizans,* Klickitat Co.

Albugo candida (Pers.) Kze. on *Arabis furcata* and *Erysimum* sp., Klickitat Co.; *Erysimum asperum,* Hood River Co., Ore.; *Sisymbrium officinale,* Klickitat Co.

PERONOSPORACEAE

Ellis reported receipt of a specimen of *Bremia lactucae* Regel. No location or host was cited.

Mucorales

MUCORACEAE

Sporodinia grandis Lk. on dead stems of *Veratrum californicum,* Yakima Co.

ASCOMYCETES

PLECTOMYCETES

Taphrinales

TAPHRINACEAE

Taphrina populi-salicis Mix on *Populus trichocarpa,* Skamania and Yakima Cos.

Erysiphales

ERYSIPHACEAE

Erysiphe communis Wallr. ex Fr. on *Amsinckia intermedia* and *Eriogonum elatum,* Klickitat Co.; *Lathyrus* sp., Skamania Co.;

Mertensia sp., Yakima Co.; *Nemophila parviflora,* Klickitat Co.; *Phlox diffusa,* Yakima Co.; *Ranunculus flamula* var. *ovalis* and *Senecio hydrophilus,* Klickitat Co.

Erysiphe graminis DC. ex Merát on *Poa pratensis* and *Triticum aestivum,* Klickitat Co.

Erysiphe polygoni DC. ex Merát on *Aquilegia formosa, Geum macrophyllum, Lotus micranthus,* and *Lupinus polyphyllus,* Klickitat Co.; *Pentstemon nemorosus,* Yakima Co.; *Trifolium microcephalum,* Klickitat Co.

Microsphaera penicillata (Wallr. ex Fr.) Lév. var. *lonicerae* (Fr.) W. B. Cooke on *Lonicera ciliosa,* Klickitat Co.; *Lonicera involucrata,* Skamania Co.

Microsphaera russellii Clint. on *Oxalis suksdorfii,* Klickitat Co.

Phyllactinia guttata (Fr.) Lév. on *Alnus rubra, Cornus pubescens, Crataegus douglasii, Holodiscus discolor,* and *Pyrus diversifolia,* Klickatat Co.

Podosphaera clandestina (Wallr. ex Fr.) Lév. on *Prunus demissa* and *Spiraea douglasii,* Klickitat Co.

Sphaerotheca macularis (Wallr. ex. Fr.) W. B. Cooke on *Agoseris* sp., *A. heterophylla, Bidens* sp., and *B. frondosa,* Klickitat Co.; *Castilleja ?suksdorfii,* Yakima Co.; *Epilobium* sp., *E. coloratum, Erigeron peregrinus, Hieracium albiflorum, Linanthus bicolor,* and *Madia exigua,* Klickitat Co.; *Mertensia* sp., Yakima Co.; *Phlox gracilis, Prunella vulgaris, Silene heterophylla,* and *Viola praemorsa,* Klickitat Co.

Uncinula salicis (DC. ex Merát) Wint. on *Populus* sp. and *Salix scouleriana,* Klickitat Co.

MELIOLIACEAE

Apiosporina collinsii (Schw.) Höhnel on *Amelanchier alnifolia,* Skamania Co.

Lasiobotrys lonicerae (Fr.) Kuntze on *Lonicera* sp., Yakima Co.; *Lonicera ciliosa,* Klickitat Co.

DISCOMYCETES-OPERCULATAE

Pezizales

HELVELLACEAE

Helvella californica Phill. on soil, Klickitat Co.

Helvella elastica Bull. ex Fr. on soil, Klickitat Co.

Helvella infula (Schaeff.) Pers. ex Fr. on soil, Klickitat Co.

Helvella lacunosa Afz. ex Fr. on soil, Klickitat Co.
Morchella angusticeps Pk. on the ground, Klickitat Co.
Morchella bispora Sorok. on the ground, Klickitat Co.
Morchella conica Pers. on the ground, Klickitat and Skamania Cos.

PEZIZACEAE

Bulgaria globosa Fr. on the ground, Klickitat Co.
Geopyxis carbonaria (A. & S.) Sacc. on soil, Klickitat Co.
Humaria scutellata (L. ex Fr.) Fckl. on litter, Yakima Co.
Humaria setosa Fckl. on litter, Klickitat Co.
Otidea alutacea (Fr.) Bres. var. *microspora* Kanouse on soil, Klickitat Co.
Paxina sp. on soil, Klickitat Co.
Peziza sp. on the ground, Klickitat, Skamania, and Yakima Cos.
Peziza araneosa (Bull.) Sacc.—reported by Ellis. Location unknown.
Sarcoscypha amplissima (Fr.) Kanouse on the ground, Klickitat Co.

Tuberales

TUBERACEAE

Geopora harknessii Fischer—record based on a report by C. G. Lloyd (as *G. cooperi*).

DISCOMYCETES-INOPERCULATAE

Helotiales

DERMATEACEAE

Calloria oleosa (Ellis) Sacc.—record based on a report by Ellis.
Pseudopeziza medicaginis (Lib.) Sacc. on *Medicago sativa,* Klickitat Co.
Scleroderris sp. Ellis reported the unpublished species "*S. fusca* Ell. & Ev." on dead branches from Klickitat Co.
Tympanis pinastri (Pers. ex Fr.) Tul. on *Pseudotsuga taxifolia,* Klickitat Co.
Tympanis pithya Karst. on *Pinus albicaulis,* Yakima Co.

GEOGLOSSACEAE

Spathularia flavida Pers. ex Fr. on the ground, Klickitat Co.

HELOTIACEAE

Belonium arabicolum Ell. & Ev. on *Arabis furcata,* Yakima Co. Seaver (Inoperc. Discom. p. 176. 1951) says "it looks like a *Lophodermium.*"

Catinula turgida (Fr.) Desm. (*Pezicula corylina* Groves) on *Corylus californica,* Klickitat Co.

Cenangium spp. on *Alnus sinuata,* Skamania Co.; *Lonicera involucrata,* Klickitat Co.

Cenangium tryblidioides Ell. & Ev. on *Salix* sp., Yakima Co.

Ciborinia bifrons (Ell. & Ev.) Seaver [*Sclerotinia bifrons* (Ell. & Ev.) Seaver & Shope] on *Populus tremuloides,* Klickitat Co.

Dasyscypha sp. on *Ceanothus velutinus,* Klickitat Co.; *Haplopappus bloomeri,* Klickitat or Yakima Co.; *Lupinus* sp., Yakima Co.; *Vaccinium membranaceum,* Skamania Co.

Dasyscypha arida (Phill.) Sacc. on *Pinus albicaulis,* Yakima Co.

Dasyscypha calycina Fckl. (*Lachnella hahniana* Seaver) on wood, Klickitat Co.

Dasyscypha cerina (Pers.) Fckl. on wood, Klickitat Co.

Dasyscypha scabrovillosa (Phill.) Sacc. on *Alnus sinuata* and *Rubus parviflorus,* Klickitat Co.

Helotium sp. on *Populus trichocarpa,* Klickitat Co.

Helotium amplum (Ell. & Ev.) Seaver (*Phialea ampla* Ell. & Ev.) on *Salix* sp., Yakima Co.

Helotium salicellum Fr. on *Salix* sp., Klickitat Co.

Helotium virgultorum Vahl. ex Fr. on *Ribes laxiflorum,* Yakima Co.

Lachnella sp. on *Helianthus annuus,* Klickitat Co.

Lachnella corticalis (Pers.) Fr. (*Lachnella rhizophila* Ell. & Ev.) on *Rhus diversiloba,* Klickitat Co.

Lachnella hyalina (Pers.) Phill. on *Salix* sp., Yakima Co.

Lasiobelonium subflavidum Ell. & Ev. on *Salix* sp., Yakima Co. Seaver (Inoperc. Discom. p. 280. 1951) suggests that this may be *Perrotia flammea* (A. & S.) Boud.

"*Peziza* spp."—Ellis identified three species of "*Peziza*" which appear to be inoperculate discomycetes. So far as we can find these were not published. These include: "*P. elongata* Ell. & Ev." and "*P. prorumpens* Ell. & Ev." on *Valeriana sitchensis,* and "*P. nigricans* Ell. & Ev." on *Veratrum californicum,* all from Yakima Co.

Sclerotinia juncigena (Ell. & Ev.) Whetzel (*Ciboria juncigena* Ell. & Ev.) on *Juncus* sp., Klickitat Co.

Sclerotinia sulcata (Desm.) Whetzel (Sclerotia only) on *Carex* sp., Klickitat Co.

Tapesia fusca (Pers.) Fckl. on *Salix* sp., Yakima Co.; *Vaccinium*

membranaceum, Skamania Co.

Trichopeziza coarctata Ell. & Ev. on *Vaccinium membranaceum,* Skamania Co.

Trichopeziza crossota (Ell.) Sacc. on *Arctostaphylos nevadensis,* Yakima Co. Seaver (Inoperc. Discom. p. 275. 1951) suggests this may be *Perrotia flammea* (A. & S.) Boud.

Trichopeziza setigera (Phill.) Sacc. on *Veratrum californicum,* Yakima Co.

MOLLISIACEAE

Mollisia cinerea (Batsch.) Karst. on wood, Klickitat Co.

Orbilia eucalypti (Phill. & Harkn.) Sacc. on *Salix* sp., Yakima Co.

PATELLARIACEAE

Agyrium densum Fckl. on wood, Klickitat Co.

Blytridium signatum (Ell. & Ev.) Sacc. on *Pseudotsuga taxifolia,* Klickitat Co.; *Tsuga mertensiana,* Yakima Co.

Heterosphaeria linariae (Rab.) Rehm on *Veratrum californicum,* Yakima Co.

Odontotrema minus Nyl. on *Tsuga mertensiana,* Yakima Co.

PHACIDIACEAE

Clithris crispa (Pers.) Rehm on coniferous wood, Yakima Co.

Coccomyces dentatus (Schum. ex Fr.) Sacc. on *Berberis nervosa,* Klickitat Co.

Rhytisma punctatum (Pers.) Fr. on *Acer macrophyllum,* Klickitat Co.

Rhytisma salicinum (Pers.) Fr. on *Salix* sp., Yakima Co.

Hysteriales

HYPODERMATACEAE

Hypoderma commune (Fr.) Duby on *Tofeldia occidentalis,* Klickitat Co.

Hypoderma robustum v. Tub. on *Abies amabilis,* Yakima Co.

Hypoderma tunicatum Ell. & Ev. on *Arctostaphylos nevadensis,* Yakima Co.

Lophodermium arundinaceum (Schrad.) Chev. on *Calamagrostis* sp., *Festuca octoflora* var. *tenella,* Yakima Co.; and *Oryzopsis exigua,* Klickitat Co.

Lophodermium consociatum Darker on *Abies amabilis,* Yakima Co.

Lophodermium maculare (Fr.) de Not. on *Amelanchier* sp., Ska-

mania Co.

Lophodermium nitens Darker on *Pinus monticola,* Klickitat Co.

Lophodermium pinastri (Schrad.) Chev. on *Pinus ponderosa,* Klickitat Co.

HYSTERIACEAE

Glonium tryblidioides Ell. & Ev. on wood, Klickitat Co.

Hysterium spp. on wood, Klickitat Co.; *Stipa occidentalis,* Yakima Co.

Hysterographium formosum (Cke.) Sacc. on *Pinus albicaulis,* Yakima Co.

Hysterographium fraxini (Pers.) de Not. on wood, Klickitat Co.; *Fraxinus oregona,* Hood River Co., Oregon.

Lophium mytilinum Pers. ex Fr. on *Pinus albicaulis,* Yakima Co.

OSTROPALES

OSTROPACEAE

Stictis chrysopsis Ell. & Ev. on *Ceanothus integerrimus,* Klickitat Co.

Stictis hysterina Fr. on *Abies* sp., Yakima Co.

Stictis pachyspora Rehm on *Salix* sp., Yakima Co.

PYRENOMYCETES

DOTHIDIALES

CORYNELIACEAE

Caliciopsis ellisii Sacc. on *Populus trichocarpa,* Klickitat Co.

DOTHIDIACEAE

Acrospermum urceolatum Olson on *Selaginella rupestris,* Klickitat Co.

Dothidea cnemones Fr. on *Anemone oregona,* Skamania Co.

Dothidea reticulata Fr. on *Lomatium suksdorfii,* Klickitat Co.

Euryachora stellaris (Pers. ex Fr.) Fckl. on *Paeonia brownii,* Klickitat Co.

HYPOCREALES

CLAVICIPTACEAE

Claviceps nigricans Tul. on *Eleocharis* sp., Montana.

Claviceps purpurea (Fr.) Tul. on *Elymus* sp., Klickitat and Skamania Cos.

HYPOCREACEAE

Nectria cinnabarina (Tode) Fr. on *Rhus diversiloba,* Klickitat Co.

PSEUDOSPHAERIALES

MYCOSPHAERELLACEAE

Mycosphaerella tassiana (de Not.) Johans. on *Arabis furcata,* Klickitat Co.

Sphaerella spp. on *Anemone oregona,* Yakima Co.; *Arabis suffrutescens, Lomatium nudicaule,* and *Trientalis latifolia, Klickitat* Co.

Sphaerella subcongregata Ell. & Ev. on *Erigeron peregrinus,* Yakima Co.

PLEOSPORACEAE

Leptosphaeria sp. on *Tofieldia occidentalis,* Klickitat Co.

Leptosphaeria hysterioides Ell. & Ev. on *Xerophyllum tenax,* Yakima Co.

Pleospora amplispora Ell. & Ev. on *Lupinus* sp., Yakima Co.

Pleospora gigaspora Karst. on litter, Yakima, Co.

Pleospora permunda (Cke.) Sacc. on *Lomatium suksdorfii,* Klickitat Co.

Pleospora vitrispora Cke. & Harkn. on *Lonicera involucrata,* Klickitat Co.

Pleospora vulgaris Niessl on *Saxifraga* sp., Klickitat Co.

Pyrenophora coronata (Niessl) Sacc. [*P. ciliata* (Ell. & Ev.) Sacc.] on *Phlox douglasii,* Klickitat Co.

SPHAERIALES

ALLANTOSPHAERIACEAE

Calosphaeria princips Tul. on *Prunus emarginata,* Klickitat Co.

Diatrype rhois (Schw.) Cke. on *Rhus diversiloba,* Klickitat Co.

Diatrypella discoidea Cke. & Pk. var. *alni* Pk. on *Alnus* sp., Klickitat Co.

Eutypella cerviculata (Fr.) Sacc. on *Alnus rubra,* Klickitat Co.

CERATOSTOMATACEAE

Rhynchostoma tinctum (Ell. & Ev.) Berl. & Vogl. on *Acer macrophyllum,* Klickitat Co.

CLYPEOSPHAERIACEAE

Anthostomella brachystoma Ell. & Ev. on *Tsuga mertensiana,* Yakima Co.

Clypeosphaeria hendersonii (Ell.) Sacc. on *Ceanothus velutinus,* Klickitat Co.

Linospora brunellae Ell. & Ev. on *Prunella vulgaris,* Klickitat Co.

DIAPORTHACEAE

Cryptospora aculeans (Schw.) Ell. & Ev.—reported by Ellis.
Thyridium lividum (Pers.) Sacc. on *Acer macrophyllum,* Klickitat Co.; wood, Yakima Co.

GNOMONIACEAE

Gnomonia setacea (Pers.) Ces. & de Not. on *Quercus* sp., Washington, county not indicated.
Gnomoniella coryli (Batsch) Sacc. on *Corylus californica,* Klickitat Co.
Gnomoniella vulgaris (Ces. & de Not.) Sacc. on *Corylus californica,* Klickitat Co.

LOPHIOSTOMATACEAE

Lophidium trifidum Ell. & Ev. on *Salix* sp., Yakima Co.

PHYLLACHORACEAE

Phyllachora ?flabella (Schw.) Thuem. on *Pteridium aquilinum* var. *pubescens,* Klickitat Co.
Phyllachora heraclei (Fr.) Fckl. on *Heracleum lanatum,* Yakima Co.
Phyllachora ?polemonii Harkn. on *Polemonium* sp., Yakima Co.
Phyllachora wittrockii (Erikss.) Sacc. on *Linnaea borealis* var. *americana,* Klickitat Co.

SPHAERIACEAE

Lasiosphaeria strigosa (Alb. & Schw. ex Fr.) Sacc. on *Acer macrophyllum,* Klickitat Co.
Lasiosphaeria stuppea Ell. & Ev. on *Tsuga mertensiana,* Yakima Co.
Melanomma alpestre Ell. & Ev. on *Arctostaphylos nevadensis,* Yakima Co.
Melanomma cupulata Ell. and Ev. on wood, Klickitat Co.; *Salix* sp., Yakima Co.
Neopeckia coulteri (Pk.) Sacc. on *Pinus albicaulis,* Yakima Co.
Rosellinia pulveracea (Ehr. ex Fr.) Fckl. on dead wood, Klickitat Co.
Rosellinia subiculata (Schw.) Sacc. on *Acer macrophyllum,* Klickitat Co.
Trematosphaeria pertusa (Pers.) Fckl. on wood, Klickitat Co.
Zignoella diaphana (Cke. & Ell.) Sacc. on wood of conifers including *Abies* sp., Yakima Co.

XYLARIACEAE

Hypoxylon fuscum Pers. ex Fr. on wood, Washington.
Hypoxylon glomeratum Cke. on *Acer macrophyllum,* Klickitat Co.
Hypoxylon neomexicanum Macbride on wood, Klickitat Co.
Hypoxylon rubiginosum (Pers.) Fr. on *Acer macrophyllum, Corylus californica,* and *Salix* sp., Klickitat Co.
Hypoxylon serpens Pers. ex Fr. *Acer macrophyllum,* Klickitat Co.
Xylaria hypoxylon (L. ex Fr.) Grev. on wood, Klickitat Co.

BASIDIOMYCETES

HETEROBASIDIOMYCETES

Pucciniales

MELAMPSORACEAE

Chrysomyxa pyrolae (DC.) Rostrup on *Pyrola bracteata,* Yakima Co.
Coleosporium madiae Cke. on *Arnica chamissonis* and *Madia sativa,* Klickitat Co.
Coleosporium occidentale Arth. on *Senecio hydrophiloides,* Klickitat Co.; *Senecio triangularis,* Yakima Co.
Coleosporium solidaginis (Schw.) Thuem. on *Pinus contorta* var. *latifolia,* Klickitat and Skamania Cos.; *Solidago canadensis,* Skamania and Yakima Cos.
Cronartium coleosporioides (Diet. & Holw.) Arth. on *Castilleja ?suksdorfii,* Yakima Co.; *Pinus contorta* var. *latifolia,* Skamania Co.
Cronartium comandrae Pk. on *Comandra umbellata,* Klickitat Co.
Hyalopsora aspidotus (Pk.) Magn. on *Dryopteris phegopteris,* Skamania Co.
Hyalopsora polypodii (Pers.) Magn. on *Cystopteris fragilis,* Klickitat Co.
Melampsora albertensis Arth. on *Populus tremuloides,* Skamania Co.
Melampsora bigelowii Thuem., on *Salix* sp., Klickitat and Yakima Cos.; *Salix amygdaloides,* Klickitat Co.
Melampsora occidentalis Jacks. on *Populus trichocarpa,* Klickitat Co.
Melampsora ribesii-purpureae Kleb., on *Salix* sp., Klickitat Co.
Melampsorella cerastii (Pers.) Schroet. on *Stellaria borealis,* Klickitat Co.

Melampsoridium betulinum (Pers.) Kleb. on *Betula glandulosa,* Klickitat Co.

Milesia laeviuscula (Diet. & Holw.) Faull on *Polypodium glycyrrhiza* and *P. hesperium,* Klickitat Co.

Pucciniastrum geoppertianum (Kuehn.) Kleb. on *Abies lasiocarpa,* Skamania and Yakima Cos.; *Vaccinium caespitosum,* Yakima Co.; *Vaccinium membranaceum,* Skamania and Yakima Cos.

Pucciniastrum goodyerae (Tranz.) Arth. on *Goodyera decipiens,* Klickitat Co.

Pucciniastrum myrtilli (Schum.) Arth. on *Vaccinium caespitosum,* Klickitat Co.; *Vaccinium membranaceum,* Skamania Co.

Pucciniastrum pustulatum (Pers.) Diet. on *Epilobium* spp., Klickitat and Yakima Cos.; *Epilobium adenocaulon,* Klickitat Co.; *Epilobium angustifolium* and *E. clavatum,* Yakima Co.; *Epilobium paniculatum,* Klickitat Co.

Pucciniastrum pyrolae (Pers.) Schroet. on *Chimaphila umbellata,* Skamania and Yakima Cos.; *Pyrola secunda,* Yakima Co.

Uredinopsis macrosperma (Cke.) P. Magn. on *Abies grandis* and *Pteridium aquilinum* var. *pubescens,* Klickitat Co.

Uredinopsis struthiopteridis Störmer on *Abies grandis,* Yakima Co.

PUCCINIACEAE

Aecidium columbiense Ell. & Ev. on *Hieracium albiflorum,* Klickitat Co.

Aecidium graebnerianum Henn. on *Habenaria* sp., *H. dilatata,* and *H. leucostachys,* Skamania Co.

Aecidium valerianellae Biv. on *Valerianella congesta,* Klickitat Co.; Hood River Co., Oregon.

Cumminsiella mirabilissima (Pk.) Nannf. on *Berberis aquifolium,* Klickitat Co.; *Berberis repens,* Skamania Co.

Gymnosporangium sp. on *Amelanchier* sp., Montana.

Gymnosporangium juniperinum (L.) Mart. on *Sorbus sitchensis,* Klickitat, Skamania, and Yakima Cos.

Gymnosporangium nelsonii Arth. on *Sorbus occidentalis,* Yakima or Skamania Co.

Nyssopsora echinata (Lév.) Arth. on *Ligusticum grayi,* Yakima Co.

Phragmidium biloculare Diet. & Holw. on *Potentilla flabellifolia,* Skamania and Yakima Cos.

Phragmidium disciflorum (Tode) J. F. James on *Rosa ?nutkana,* Klickitat Co.

Phragmidium ivesiae Syd. on *Potentilla flabelliformis,* Spokane Co.; *Potentilla gracilis,* Klickitat Co.

Phragmidium montivagum Arth. on *Rosa* sp. and *R. gymnocarpa,* Klickitat Co.

Phragmidium occidentale Arth. on *Rubus parviflorus,* Klickitat and Skamania Cos.

Phragmidium rosae-californicae Diet. on *Rosa* sp., *R. gymnocarpa,* and *R. nutkana,* Klickitat Co.

Phragmidium rubi-idaei (DC.) Karst. on *Rubus leucodermis,* Klickitat Co.

Phragmidium speciosum (Fr.) Cke. on *Rosa pisocarpa,* Klickitat Co.

Puccinia absinthii (Hedw. f.) DC. on *Artemisia dracunculoides* and *A. tridentata,* Klickitat Co.; *Artemisia rigida,* Spokane Co.

Puccinia albulensis Magn. on *Veronica wormskjoldii,* Yakima Co.

Puccinia amphispilusa Diet. & Holw. on *Polygonum* sp., Yakima Co.

Puccinia areolata Diet. & Holw. on *Caltha biflora,* Klickitat and Skamania Cos.

Puccinia asarina Kunze on *Asarum caudatum,* Skamania Co.

Puccinia asperior Ell. & Ev. on *Lomatium dissectum,* Klickitat Co.

Puccinia atrofusca (Dudl. & Thomps.) Holw. on *Carex geyeri* and *C. rossii,* Klickitat Co.

Puccinia balsamorhizae Pk. on *Balsamorhiza deltoidea,* Klickitat Co.

Puccinia bistortae (Str.) DC. on *Polygonum bistortoides,* Klickitat Co.; *Polygonum newberryi,* Skamania Co.

Puccinia blasdalei Diet. & Holw. on *Allium acuminatum,* Klickitat Co.

Puccinia calochorti Pk. on *Calochortus* sp., Monterey Co., Calif.; *Calochortus lobbii,* Skamania and Yakima Cos.; *Calochortus longebarbatus,* Klickitat Co.

Puccinia caricis (Schum.) Schroet. on *Carex* sp., *C. nebraskensis, C. rossii,* and *C. rostrata,* Klickitat Co.

Puccinia caricis (Schum.) Schroet. var. *grossulariata* Arth. on *Ribes divaricatum,* Klickitat Co.

Puccinia chelonis Diet. & Holw. on *Pentstemon nemorosus,* Skamania and Yakima Cos.

Puccinia circaeae Pers. on *Circaea pacifica,* Klickitat Co.

Puccinia cirsii Lasch on *Cirsium remotifolium,* Skamania and Yakima Cos.

Puccinia cnici Mart. on *Cirsium lanceolatum,* Klickitat Co.; Hood River Co. and Multnomah Co., Oregon.

Puccinia collinsiae [Ell. & Ev.] P. Henn. on *Collinsia parviflora, C. rattanii,* and *Tonella tenella,* Klickitat Co.

Puccinia comandrae Pk. on *Comandra pallida,* and *C. umbellata,* Klickitat Co.

Puccinia crandallii Pam. & Hume on *Symphoricarpos albus,* Klickitat Co.

Puccinia cryptanthes Diet. & Holw. on *Cryptantha torreyana,* Klickitat Co.

Puccinia cyani [Schleich.] Pass. on *Centaurea cyanus,* Klickitat Co.

Puccinia dichelostemmae Diet. & Holw. on *Brodiaea* sp. and *B. puchella,* Klickitat Co.; *Brodiaea coronaria,* Wasco Co., Oregon.

Puccinia difformis Kunze on *Galium aparine,* Klickitat Co.

Puccinia douglasii Ell. & Ev. on *Phlox diffusa,* Yakima Co.

Puccinia effusa Diet. & Holw. on *Viola praemorsa,* Klickitat Co.

Puccinia ellisii de Toni on *Angelica genuflexa,* Klickitat Co.

Puccinia extensicola Plowr. var. *asteris* (Thuem.) Arth. on *Aster ledophyllus,* Skamania Co.; *Aster occidentalis* var. *intermedia,* Klickitat Co.

Puccinia giliae Harkn. on *Collomia grandiflora,* Klickitat Co.

Puccinia graminis Pers. on *Triticum aestivum,* Klickitat Co.

Puccinia granulispora Ell. & Gall. on *Allium* sp., Skamania Co.

Puccinia harknessii Vize on *Stephanomeria minor* and *S. paniculata,* Klickitat Co.

Puccinia helianthi Schw. on *Helianthus annuus,* Klickitat Co.

Puccinia heucherae (Schw.) Diet. on *Heuchera cylindrica,* Klickitat Co.; *Heuchera glabella,* Skamania Co.; *Mitella* sp., Yakima Co.; *Mitella breweri,* Skamania Co.; *Mitella diversifolia,* Klickitat Co.; *Mitella pentandra, Saxifraga* sp., and *Saxifraga arguta,* Yakima Co.; *Saxifraga bracteosa* and *Saxifraga ?fragosa,* Klickitat Co.; *Saxifraga mertensiana,* Yakima Co.; *Saxifraga ?occidentalis,* Spokane Co.; *Saxifraga oregana,* Klickitat Co.; *Tellima grandiflora,* Klickitat Co.; *Tiarella unifoliata,* Skamania Co.

Puccinia hieracii (Schum.) Mart. on *Agoseris* sp., Yakima Co.; *Agoseris glauca,* Spokane Co.; *Agoseris gracilens,* Yakima Co.; *Crepis acuminata,* Klickitat Co.; *Hieracium* sp., Klickitat and Skamania Cos.; *Hieracium albiflorum,* Klickitat Co.; *Hieracium canadense,* Klickitat and Spokane Cos.; *Hieracium gracile,*

Yakima Co.; *Hieracium scouleri,* Klickitat Co.; *Hypochaeris glabra,* Skamania Co.; *Taraxacum* sp., Klickitat Co.

Puccinia holboellii (Hornem.) Rostrup on *Arabis furcata* and *A. lyallii,* Yakima Co.

Puccinia interveniens [Pk.] Bethel on *Sidalcea* sp., Spokane Co.

Puccinia iridis (DC.) Wallr. on *Iris missouriensis,* Klickitat Co.

Puccinia jonesii Pk. var. *jonesii* on *Lomatium columbianum, L. suksdorfii,* and *L. triternatum,* Klickitat Co.

Puccinia malvacearum Bert. on *Althaea rosea, Malva* sp., *and M. rotundifolia,* Klickitat Co.

Puccinia mariae-wilsoniae G. W. Clint. on *Claytonia cordifolia,* Skamania and Yakima Cos.

Puccinia mcclatchieana Diet. & Holw. on *Scirpus microcarpus,* Klickitat Co.

Puccinia menthae Pers. on *Mentha arvensis* var. *canadensis, M. spicata,* and *Satureja douglasii,* Klickitat Co.

Puccinia mesomejalis Berk. & Curt. on *Clintonia unifolia,* Klickitat Skamania, and Yakima Cos.

Puccinia monoica [Pk.] Arth. on *Arabis canescens* and *Phoenicaulis cheiranthoides,* Klickitat Co.

Puccinia montanensis Ellis on *Elymus glaucus,* Klickitat Co.

Puccinia nuda Ell. & Ev. on *Arnica chamissonis, Lagophylla ramosissima,* and *M. sativa,* Klickitat Co.

Puccinia obscura Schroet. on *Luzula campestre,* Klickitat Co.

Puccinia oenotherae Vize on *Clarkia rhomboidea, Godetia* sp., *G. epilobioides* and *G. quadrivulnera,* Klickitat Co.; *Oenothera* sp., Spokane Co.

Puccinia ortonii Jackson on *Dodecatheon* sp. and *D. alpinum,* Skamania and Yakima Cos.

Puccinia parkerae Diet. & Holw. on *Ribes lacustre,* Skamania Co.

Puccinia pattersoniana Arth. on *Brodiaea howellii,* Klickitat Co.

Puccinia pazschkei Diet. on *Saxifraga mertensiana,* Yakima Co.

Puccinia pimpinellae (Str.) Mart. on *Osmorhiza chilensis,* Klickitat Co.

Puccinia plumbaria Pk. on *Gilia* sp., *G. capitata,* Klickitat Co.; *Phlox* sp. Klickitat and Skamania Cos.; *Phlox douglasii* and *P. gracilis,* Klickitat Co.

Puccinia poae-sudeticae (West.) Jørg. on *Poa pratensis* and *Poa vaseyochloa,* Klickitat Co.

Puccinia polygoni-amphibii Pers. on *Polygonum* sp. and *P. natans,* Klickitat Co.

Puccinia pulsatillae Kalchbr. on *Anemone* sp., Yakima Co.; *Trautvetteria grandis,* Skamania Co.

Puccinia punctata Lk. on *Galium triflorum,* Klickitat Co.

Puccinia rubigo-vera (DC.) Wint. var. *agropyri* (Erikss.) Arth. on *Actea arguta,* Skamania Co.; *Agropyron* sp., *A. dasystachum,* and *A. spicatum,* Klickitat Co.; *Anemone* sp., Montana; *Aquilegia formosa,* Skamania Co.; *Bromus* sp., *B. carinatus,* and *B. marginatus,* Klickitat Co.; *Clematis ligusticifolia,* Spokane Co.; *Elymus* sp., Klickitat Co.; *Elymus glaucus,* Klickitat and Skamania Cos.; *Ranunculus glaberrimus* var. *ellipticus,* Spokane Co.; *Ranunculus hebecarpus* and *R. occidentalis,* Klickitat Co.; *Thalictrum* sp., Yakima Co.

Puccinia rubigo-vera var. *apocrypta* (Ell. & Tr.) Arth. on *Hydrophyllum capitatum,* Klickitat Co.; *Hydrophyllum tenuipes,* Skamania Co.; *Nemophila parviflora* and *Phacelia circinata,* Klickitat Co.

Puccinia rubigo-vera var. *secalis* (Erikss.) Carl. on *Secale cereale,* Klickitat Co. Note: R. Sprague indicates that Suksdorf antedated by twenty years the earliest previous record of *Puccinia rubigo-vera* in Washington.

Puccinia scandica Johans. on *Epilobium clavatum,* Yakima Co.

Puccinia subangulata Holw. on *Brodiaea* sp. and *B. puchella,* Klickitat Co.

Puccinia subcircinata Ell. & Ev. on *Senecio hydrophilus,* Klickitat Co.; *Senecio triangularis,* Yakima Co.

Puccinia suksdorfii Ell. & Ev. on *Agoseris glauca,* Klickitat Co.

Puccinia symphoricarpi Harkn. on *Symphoricarpos albus,* Klickitat and Skamania Cos.

Puccinia vagans (DC.) Arth. var. *epilobii-tetragoni* (DC.) Arth. on *Epilobium* sp., *E. adenocaulon, E. ?coloratum, E. paniculatum,* Klickitat Co.; and *Gayophytum* sp., Yakima Co.

Puccinia vagans (DC.) Arth. var. *gayophyti* (Bill.) Arth. on *Gayophytum* sp., Yakima Co.; *Gayophytum caesium,* Klickitat Co.

Puccinia veratri (DC.) Duby on *Epilobium paniculatum, Veratrum* sp., *V. californicum,* Klickitat Co.

Puccinia violae (Schum.) DC. on *Viola* sp., Oregon; *Viola adunca,* Klickitat Co.; *Viola glabella,* Klickitat and Skamania Cos.

Tranzschelia thalictri (Chev.) Diet. on *Thalictrum* sp., Yakima Co.

Uromyces amoenus Syd. on *Anaphalis margaritacea,* Skamania Co.

Uromyces brodiaeae Ell. & Harkn. on *Brodiaea hyacinthina,* Klickitat Co.

Uromyces coloradensis Ell. & Ev. on *Vicia americana,* Klickitat and Yakima Cos.; *Vicia americana* var. *linearis,* Klickitat Co.

Uromyces dictyosperma [Ell. & Ev.] Tranz. on *Euphorbia dictyosperma,* Klickitat Co.

Uromyces eleocharidis Arth. on *Eleocharis* sp., Skamania Co.

Uromyces fabae (Pers.) deBary on *Lathyrus lanszwertii,* Skamania and Yakima Cos.; *Vicia americana,* Klickitat Co.

Uromyces gentianae Arth. on *Gentiana acuta,* Whatcom Co.

Uromyces glycyrrhizae (Rab.) Magn. on *Glycyrrhiza lepidota,* Klickitat Co.

Uromyces heterodermus Syd. on *Erythronium grandiflorum,* Klickitat Co.; *Erythronium montanum,* Skamania Co.

Uromyces holwayi Lagerh. on *Lilium columbianum,* Klickitat and Skamania Cos.

Uromyces intricatus Cke. on *Eriogonum compositum,* Klickitat Co.; *Eriogonum umbellatum,* Yakima Co.; *Eriogonum vimineum,* Klickitat Co.

Uromyces jacksonii Arth. & Froome on *Deschampsia elongata,* Klickitat Co.

Uromyces junci (Desm.) L. Tul. on *Juncus balticus,* Klickitat Co. This species was also reported on *J. falcatus* by Holway; no location was given. It is more likely that the *Uromyces* on *J. falcatus* was the following species:

Uromyces junci-effusi Syd. on *Juncus ensifolius,* Klickitat and Spokane Cos.; *Juncus nevadensis* and *J. orthophyllus,* Klickitat Co.

Uromyces lupini Berk. & Curt. on *Lupinus ornatus* and *L. polyphyllus,* Klickitat Co.

Uromyces minor Schroet. on *Trifolium ciliatum, T. ?dubium,* and *T. oliganthum,* Klickitat Co.

Uromyces miurae Syd. on *Fritillaria lanceolata,* Klickitat Co.

Uromyces occidentalis Diet. on *Lupinus lyallii,* Yakima Co.

Uromyces perigynius Halsted on *Carex athrostachya,* Spokane Co.

Uromyces polygoni (Pers.) Fckl. on *Polygonum aviculare* and *P. natans,* Klickitat Co.

Uromyces probus Arth. on *Sisyrinchium douglasii,* Klickitat Co.

Uromyces proëminens (DC.) Pass. on *Euphorbia glyptosperma,* Hood River Co., Oregon; *Euphorbia serphyllifolia,* Klickitat Co.; Wasco Co., Oregon.

Uromyces punctatus Schroet. on *Astragalus* sp., Gallatin Co., Montana; *Astragalus glareosus,* Klickitat Co.

Uromyces silphii [Burr.] Arth. on *Juncus longistylis,* Spokane Co.

Uromyces spragueae Harkn. on *Spraguea umbellata,* Klickitat Co.

Uromyces suksdorfii Diet. & Holw. on *Silene oregana,* Oregon; *Silene pacifica,* Klickitat, Skamania, and Yakima Cos.

Uromyces trifolii (Hedw. f.) Lév. var. *trifolii-repentis* (Liro) Arth. on *Trifolium repens,* Klickitat Co.

Ustilaginales

USTILAGINACEAE

Cintractia caricis (Pers.) Magn. on *Carex* sp., Skamania and Yakima Cos.; *Carex geyeri* and *C. spectabilis,* Yakima Co.

Urocystis agropyri (Preuss) Schroet. on *?Elymus glaucus,* Klickitat Co.

Ustilago avenae (Pers.) Rostr. on *Avena sativa,* Klickitat Co.

Ustilago bistortarum (DC.) Koern on *Polygonum* sp., Yakima Co.

Ustilago bullata Berk. on *Bromus* sp., Skamania Co.; *Bromus carinatus,* Klickitat and Yakima Cos.; *Bromus ?commutatus,* Klickitat Co.; *Bromus vulgaris,* Skamania Co.; *Hordeum brachyantherum, H. jubatum* var. *caespitosum,* Klickitat Co.

Ustilago clintoniana Cif. on *Silene ?macounii,* Yakima Co.

Ustilago crus-gallii Tr. & Earle on *Echinochloa crus-galli,* Klickitat Co.

Ustilago duriaeana Tul. on *Cerastium* sp., Klickitat Co.

Ustilago hordei (Pers.) Lagh. on *Avena sativa,* Klickitat Co.

Ustilago mulfordiana Ell. & Ev. on *Festuca octoflora* var. *tenella* and *F. reflexa,* Klickitat Co.

Ustilago macrospora Desm. on *Phalaris arundinacea,* Klickitat Co.

Ustilago nummularia Speg. on *Stipa commata,* Klickitat Co.

Ustilago punctata Clint. on *Polygonum newberryi,* Yakima Co.

Ustilago spegazzini Hirschh. var. *agrestis* (Syd.) G. W. Fischer & Hirschh. on *Sitanion hystrix,* Yakima Co.; *Stipa* sp., Klickitat Co.

Ustilago striiformis (Westend.) Niessl. on *Phleum pratense,* Klickitat Co.

Ustilago utriculosa (Nees) Tul. on *Polygonum hydropiperoides,* Klickitat Co.

Ustilago vinosa (Berk.) Tul. on *Oxyria digyna,* Yakima Co.

Ustilago williamsii (Griff.) Lav. on *Stipa thurberiana,* Klickitat Co.

TILLETIACEAE

Doassansia alismatis (Nees) Cornu on *Alisma* sp., Klickitat Co.

Doassansia martianoffiana (Thuem.) Schroet. on *Potamogeton* sp., Klickitat Co.

Entyloma calendulae (Oud.) de Bary on *Arnica chamissonis,* Skamania and Yakima Cos.; *Hieracium* sp., Yakima Co.; *Senecio* sp., Skamania Co.

Entyloma compositarum Farl. on *Arnica cordifolia,* Klickitat Co.; *Erigeron peregrinus,* Mt. Adams; *Hieracium albiflorum,* Klickitat Co.

Entyloma ranunculi (Bon.) Schroet. on *Ranunculus* sp., Klickitat and Skamania Cos.; *Ranunculus occidentalis* and *R. ?uncinatus,* Klickitat Co.

Tilletia asperifolia Ell. & Ev. on *Muhlenbergia asperifolia,* Klickitat Co.

Tilletia caries (DC.) Tul. on *Triticum aestivum,* Klickitat Co.

Tilletia elymi Diet. & Holw. on *Elymus* sp., Skamania Co.

Tilletia fusca Ell. & Ev. on *Festuca octoflora* var. *tenella,* Spokane Co.

Tuburcinia trientalis Berk. & Br. on *Smilacina stellata* and *Streptopus curvipes,* Skamania Co.

Tremellales

TULASNELLACEAE

Tulasnella pruinata Bourd. & Galz. on *Salix* sp., Klickitat Co.

TREMELLACEAE

Exidia candida Lloyd on *Acer macrophyllum* and *Corylus californica,* Klickitat Co.

Pseudohydnum gelatinosum (Pers. ex Fr.) Karst. on litter, Klickitat Co.

Phlogiotis helvelloides (Pers.) Martin on litter, Klickitat Co.

Sebacina calcea (Pers.) Bres. on *Acer macrophyllum, Philadelphus* sp., and *Sambucus glaucus,* Klickitat Co.

Sebacina plumbescens Burt on *Populus trichocarpa,* Klickitat Co.

Tremella sp. on *Corylus californica,* Klickitat Co.

DACRYMYCETACEAE

Craterocalla rubella Pers. on wood, Klickitat Co.

Dacrymyces sp. on wood, Klickitat Co.

Dacrymyces abietinus (Pers.) Schroet. on *Pinus ponderosa,* Klickitat Co.

Dacrymyces chrysocomus Tul. on *Tsuga mertensiana,* Yakima Co.

Dacrymyces palmatus (Schw.) Bres. apud Höhn. on wood, Klickitat Co.

Guepiniopsis alpinus (Tr. & Earle) Brasfield on wood, Yakima Co.

HOMOBASIDIOMYCETES

Exobasidiales

EXOBASIDIACEAE

Exobasidium burtii Zeller on *Rhododendron albiflorum,* Skamania Co.

Exobasidium cassiopes Pk. on *Cassiope mertensiana,* Skamania and Yakima Cos. Burt considered this synonymous with *E. vaccinii.*

Exobasidium vaccinii (Fckl.) Wor. on *Arctostaphylos nevadensis, Gaultheria ovatifolia, Vaccinium* sp., and *V. membranaceum,* Yakima Co.

Exobasidium vaccinii-uliginosi Boud. on *Arctostaphylos columbiana,* and *Vaccinium membranaceum,* Skamania Co.; *Vaccinium* sp., Yakima Co.

Exobasidium sp. on *Phyllodoce empetriformis,* Skamania and Yakima Cos.

Aphyllophorales

THELEPHORACEAE

Aleurodiscus sp. on *Fraxinus oregona,* Klickitat Co.

Aleurodiscus disciformis (DC. ex Fr.) Pat. on wood, Klickitat Co.

Aleurodiscus roseus (Pers. ex Fr.) Höhn. & Litsch. on *Populus trichocarpa,* Klickitat Co.

Coniophora puteana (Schum. ex Fr.) Karst. on *Crataegus douglasii, Fraxinus oregona,* and *Quercus garryana,* Klickitat Co.

Coniophora olivacea ([Fr.] ex Pers.) Karst. on wood *Pinus ponderosa,* Klickitat Co.

Coniophora suffocata (Pk.) Mass. on conifer board and *Fraxinus oregona,* Klickitat Co.

Corticium spp. A number of unidentified specimens of *Corticium* species are filed in the Suksdorf collections. These occurred on

wood, Klickitat and Yakima Cos.; on *Abies lasiocarpa, Pinus contorta* var. *latifolia* and *Ribes watsonianum,* Yakima Co.; and *Acer macrophyllum, Corylus californica, Fraxinus oregona, Pinus ponderosa, Pteridium aquilinum* var. *pubescens, Rosa nutkana, Salix* sp. and *Sambucus glauca,* Klickitat Co.

Corticium albulum (Atk. & Burt) Rogers & Jackson on *Acer macrophyllum, Fraxinus oregona, Pinus ponderosa, Populus trichocarpa,* and *Salix* sp., Klickitat Co.

Corticium bisporum (Schroet.) Höhn. & Litsch. on *Pinus contorta* var. *latifolia,* Klickitat and Yakima Cos.; *Pinus ponderosa, Rosa nutkana,* and *Salix* sp., Klickitat Co.

Corticium bombycinum (Sommerf.) Karst. on *Salix* sp., Klickitat Co.

Corticium contiguum Karst. on *Fraxinus oregona*—Burt report.

Corticium corruge (Burt) Burt in sched. ex Rogers & Jackson on *Pinus contorta* var. *latifolia,* Yakima Co.

Corticium flavo-marginatum Burt on *Quercus garryana,* Klickitat Co.

Corticium lactescens Berk. on *Quercus garryana,* Klickitat Co.

Corticium pellicula Karst.—Burt report.

Corticium porosum Berk. & Curt. on *Populus tremuloides* and *P. trichocarpa,* Klickitat Co.

Corticium punctulatum Cke. on *Acer macrophyllum, Ceanothus integerrimus,* and *Pseudotsuga taxifolia,* Klickitat Co.

Corticium radiosum Fr. on *Abies amabilis,* Skamania Co.; *Salix* sp., Klickitat Co.

Corticium ?rubricundum Burt—Burt report.

Corticium spretum Burt on *Fraxinus oregona,* Klickitat Co.—Burt report.

Corticium sulphureum (Pers. ex Fr.) Fr. on *Abies grandis* and *?Pseudotsuga* sp., Klickitat Co.

Cyphella galeata (Schum.) Fr. on various species of mosses, Klickitat Co.

Cytidia salicina (Fr.) Burt on *Salix* sp., Klickitat Co.

Hymenochaete sp. on wood, Klickitat Co.

Hymenochaete badio-ferruginea (Mont.) Lév. on *Quercus garryana,* Klickitat Co.

Hymenochaete cinnamomea (Pers. ex Fr.) Bres. on *Acer macrophyllum,* Klickitat Co.

Hymenochaete curtisii (Berk.) Morgan on *Quercus garryana*—Burt report.

Hymenochaete fimbriata Ell. & Ev. on *Pinus contorta* var. *latifolia*, Yakima Co.

Hymenochaete spreta Pk. on *Acer macrophyllum*—Burt report.

Hymenochaete tabacina (Sow. ex Fr.) Lév. on *Acer macrophyllum*, *Prunus emarginata*, *Pseudotsuga taxifolia*, and *Salix* sp., Klickitat Co.

Hypochnus cervinus Burt on *Acer macrophyllum*, Klickitat Co.

Hypochnus pannosus (Berk. & Curt.) Burt on *Pinus ponderosa*—Burt report.

Hypochnus subvinosus Burt—Burt report.

Pellicularia isabellina (Fr. ex Pers.) Rogers on *Pinus ponderosa*, Klickitat Co.

Pellicularia vaga (Berk. & Curt.) Rogers on *Abies grandis*, *Sambucus glaucus*, and either *Acer* sp. or *Pseudotsuga taxifolia*, Klickitat Co.

Peniophora affinis Burt on *Alnus* sp., *Pinus contorta* var. *latifolia*, Klickitat and Yakima Cos.; *Populus trichocarpa* and *Salix* sp., Klickitat Co.

Peniophora aspera (Pers.) Sacc. on wood, Yakima Co.

Peniophora carnea (Berk. & Cke.) Cke.—Burt report.

Peniophora cinerea (Pers. ex Fr.) Cke. on *Acer macrophyllum*, *Corylus californica*, *Fraxinus oregona*, *Populus* sp., *Purshia tridentata*, *Quercus garryana*, and *Rhus diversiloba*, Klickitat Co.

Peniophora crassa Burt on *Corylus californica*, Klickitat Co.

Peniophora cremea (Bres.) Sacc. & Syd. on *Pinus ponderosa*—Burt report.

Peniophora decorticans Burt on *Acer macrophyllum*, *Quercus garryana*, and *Rhus diversiloba*, Klickitat Co.

Peniophora incarnata (Pers. ex Fr.) Karst. on *Acer macrophyllum*, *Crataegus douglasii*, *Quercus garryana*, *Rhus diversiloba*, *Salix* sp., and *Sambucus glaucus*, Klickitat Co.

Peniophora glebulosa (Bres.) Sacc. & Syd. on *Pinus ponderosa*, Klickitat Co.

Peniophora luna Romell on *Pinus contorta* var. *latifolia*, Yakima Co.

Peniophora mutata (Peck) Höhn. & Litsch. on *Corylus californica*, Klickitat Co.

Peniophora nuda (Fr.) Bres. on *Corylus californica* and *Ribes divaricatum*, Klickitat Co.

Peniophora subalutacea (Karst.) Bres. on *Pinus contorta* var. *latifolia,* Yakima Co.

Peniophora tenuis (Pat.) Mass. on *Pinus ponderosa,* Klickitat Co.

Peniophora velutina ([DC.] ex Fr.) Cke. on *Corylus californica,* Klickitat Co.

Solenia anomala (Pers. ex Fr.) Fckl. on *Corylus californica* and *Salix* sp., Klickitat Co.

Stereum sp. on the ground, Klickitat Co.

Stereum fasciatum Schw.—Burt report.

Stereum hirsutum Willd. ex Fr. on *Quercus garryana, Rosa nutkana, Salix* sp., and *S. lasiandra,* Klickitat Co.

Stereum patelliforme Burt on *Acer macrophyllum, Corylus californica, Fraxinus oregona, Purshia tridentata, Rhus diversiloba,* and *Rosa nutkana,* Klickitat Co.

Stereum purpureum Pers. ex Fr. on *Alnus* sp., Klickitat Co.

Stereum rugisporum (Ell. & Ev.) Burt on conifer wood, Yakima Co.

Stereum sanguinolentum A. & S. ex Fr. on *Pinus contorta* var. *latifolia* and *P. ponderosa,* Klickitat Co.

Stereum sulcatum Burt on *Tsuga mertensiana,* Yakima Co.

Thelephora caespitulans Schw. on the ground, Klickitat Co.

Thelephora caryophyllaea Schaeff. ex Fr. on the ground, Klickitat Co.

Thelephora scissilis Burt on the ground, Klickitat Co.

Tomentella sp. on wood, Klickitat Co.

MERULIACEAE

Merulius bellus Berk. & Curt. on *Pinus contorta* var. *latifolia,* Yakima Co.

Merulius confluens Schw. on *Acer macrophyllum,* Klickitat Co.

Merulius corium Fr. on *Acer macrophyllum,* Klickitat Co.

Phlebia albida Fr. on *Pinus ponderosa,* Klickitat Co.

Phlebia radiata Fr. on wood, Klickitat Co.; *Alnus sinuata,* Yakima Co.

CLAVARIACEAE

Several specimens of *Clavaria* and segregate genera are represented in the Suksdorf herbarium. Some of these are accompanied by habit sketches and notes. No attempt has been made to identify this material.

HYDNACEAE

Dentinum repandum (L. ex Fr.) S. F. Gray on the ground, Klickitat Co.

Grandinia corrugata Fr. on *Prunus emarginata,* Klickitat Co.

Hydnum spp.—Several stipitate specimens of this genus in its broadest sense are in the Suksdorf collection from Klickitat and Yakima Cos.

Irpex owensii Lloyd on *Corylus californica,* Klickitat Co.

Mycoacia himantia (Schw.) Miller & Boyle on *Quercus garryana,* Klickitat Co.

Odontia sp. on *Acer macrophyllum,* Klickitat Co.

Odontia acerina Pk. on wood, Klickitat Co.

Odontia fimbriata Pers. ex Fr. on *Acer macrophyllum* and *Amelanchier alnifolia,* Klickitat Co.; *?Salix* sp., Skamania Co.

Odontia pinastri Quél. on *Corylus californica,* Klickitat Co.; *Salix* sp., Klickitat Co.

Odontia setigera (Fr.) Miller on *Corylus californica, Rhus diversiloba,* and *Ribes divaricatum,* Klickitat Co.

Odontia uda (Fr.) Bres. on *Alnus* sp., Klickitat Co.

Radulum sp. on *Corylus californica,* Klickitat Co.

Radulum orbiculare Fr. on *Quercus garryana,* Klickitat Co.

POLYPORACEAE

Daedalea unicolor Bull. ex Fr. on *Acer circinatum,* Klickitat Co.

Fomes igniarius (L. ex Fr.) Gill. on *Salix lasiandra,* Klickitat Co.

Fomes pinicola (Swartz) Cooke on *Abies grandis* and *Pseudotsuga taxifolia,* Klickitat Co.

Lenzites sepiaria Fr. on wood, Klickitat Co.

Polyporus abietinus Dicks. ex Fr. on *Abies lasiocarpa,* Yakima Co.; *Pinus ponderosa,* Klickitat Co.

Polyporus adustus Willd. ex Fr. on *Alnus* sp., Klickitat Co.

Polyporus leucospongia Cke. & Harkn. on conifer wood, Yakima Co.

Polyporus ovinus (Schaeff.) Fr. on the ground, Mt. Adams.

Polyporus perennis L. ex Fr. on the ground, Klickitat and Skamania Cos.

Polyporus picipes Fr. on wood, Klickitat Co.

Polyporus tomentosus Fr. on the ground, Klickitat and Yakima Cos.

Polyporus versicolor L. ex Fr. on *Alnus* sp., Klickitat Co.

Poria asiatica (Pilát) Overh. on wood, Klickitat Co.

Poria crassa (Karst.) Sacc. on *Quercus garryana,* Klickitat Co.

Poria ferrea (Pers.) Bourd. & Galz. on *Acer macrophyllum,* Klickitat Co.
Poria purpurea (Fr.) Cooke on *Acer macrophyllum,* Klickitat Co.
Poria spissa (Schw.) Cooke on *Pinus ponderosa,* Klickitat Co.
Poria vulgaris (Fr.) Cke. on *?Pseudotsuga* wood, Klickitat Co.

Agaricales

BOLETACEAE[7]

Boletus aureus Bull. ex Fries on the ground, Klickitat Co.
Boletus edulis Bull. ex Fries subsp. *pinicola* Vitt. on the ground, Yakima Co.
Boletus pulverulentus Opat. on the ground, Klickitat Co.
Boletinus sp. on the ground, Mt. Adams.
Suillus granulatus (L. ex Fries) Kuntze on the ground, Klickitat Co.
Suillus hirtellus (Peck) Kuntze on the ground, Klickitat Co.
Suillus variegatus (Schw. ex Fries) Kuntze on the ground, Mt. Adams.
Xeroconus chrysenteron (Bull. ex Fries) Quélet on the ground, Klickitat Co.

AGARICACEAE

(by D. E. Stuntz[8])

Agaricus arvensis Fries on the ground, Klickitat Co.
Agaricus crocodilinus Murrill on the ground, Klickitat Co.
Agaricus placomyces Peck var. *placomyces* on the ground, Klickitat Co.
Agaricus silvaticus Schaeffer ex Fries on the ground, Klickitat Co.
Agaricus silvicola (Vittadini) Sacc. on the ground, Klickitat Co.
Agrocybe acericola (Peck) Singer on rotten wood, Klickitat and Yakima Cos.
Agrocybe praecox (Fries) Fayod on the ground, Klickitat Co.
Amanita muscaria (Fries) Quélet on the ground, Klickitat and Yakima Cos.

---

[7] Specimens of the Boletaceae were identified by W. H. Snell. The authors wish to thank Dr. Snell for his help with this section.

[8] The Suksdorf collections contain some one hundred and forty specimens of agarics. Thus the agarics represent nearly ten per cent of all Suksdorf's fungus collections. Although some of the specimens were insect riddled, it was felt that an agaricologist could identify many of them, since spore prints, Suksdorf's field notes, and habit sketches accompany many of the specimens. D. E. Stuntz kindly agreed to undertake the identification of this material. The authors wish to express their appreciation to Dr. Stuntz for his help with this portion of the Suksdorf collections.

Amanitopsis vaginata (Fries) Roze on the ground, Klickitat Co.
Bolbitius vitellinus Fries on the ground, Klickitat Co.
Cantharellus clavatus Fries on the ground, Klickitat Co.
Cantharellus floccosus Schw. on the ground, Klickitat Co.
Clitocybe sp. on dead wood of *Populus* sp., Klickitat Co.
Clitocybe dicolor? on the ground, Klickitat Co.
Clitocybe rivulosa (Fries) Quélet on the ground, Klickitat Co.
Clitocybe washingtonensis Murrill on the ground, Klickitat Co.
Collybia sp. on the ground, Klickitat Co.
Collybia acervata (Fries) Gillet on dead wood, Klickitat Co.
Conocybe coprophila Kühner on the ground, Klickitat Co.
Coprinus atramentarius Fries on the ground, Klickitat Co.
Coprinus comatus (Muell.) S. F. Gray var. *campestris* on the ground, Klickitat Co.
Coprinus micaceus Fries on the ground, Klickitat Co.
Coprinus niveus Fries on horse manure, Klickitat Co.
Coprinus plicatilis Fries on the ground, Klickitat Co.
Coprinus sterquilinus Fries on the ground, Klickitat Co.
Cortinarius orellanus Fries on the ground, Klickitat and Yakima Cos.
Cortinarius orichalceus Fries on the ground, Mt. Adams.
Cortinarius sanguineus Fries on the ground, Klickitat Co.
Crepidotus fulvifibrillosus Murrill on rotting wood of *Populus* sp., Klickitat Co.
Crepidotus haustellaris (Fr.) Karsten on rotting wood of *Populus* sp., Klickitat Co.
Crepidotus versutus (Peck) Sacc. on *Abies lasiocarpa*, Yakima Co.; *Acer circinatum, Populus* sp., Klickitat Co.
Cystoderma amianthinum (Fries) Fayod var. *amianthinum* on the ground, Klickitat Co.
Cystoderma fallax A. H. Smith & R. Singer on the ground, Klickitat Co.
Cystoderma granulosum (Fries) Fayod var. *granulosum* on the ground, Klickitat Co.
Flammula condensa Peck on the ground, Klickitat Co.
Flammula lubrica (Fries) Quélet on the ground, Yakima Co.
Flammula spumosa (Fries) Quélet on the ground, Mt. Adams.
Galerina badipes (Ricken) Kühner on rotten wood, Klickitat Co.
Galerina hypnorum (Fries) Kühner on the ground, Klickitat Co.
Galerina marginata (Fries) Kühner on rotten wood, Klickitat Co.

Galerina mycenopsis (Ricken) Kühner on the ground, Klickitat Co.
Gomphidius glutinosus (Schaeff. ex Fries) Fries on the ground, Klickitat Co.
Gomphidius ochraceus Kauffman on the ground, Mt. Adams.
Gomphidius oregonense Peck on wood, Klickitat Co.
Gomphidius vinicolor Peck on the ground, Klickitat Co.
Gymnopilus liguiritiae (Fries) Karsten on decaying wood of *Pinus ponderosa,* Klickitat Co.
Hebeloma crustuliniforme (Fries) Quélet, sensu Bresadola, on the ground, Klickitat Co.
Hygrophorus cantharellus Schw. on the ground, Yakima Co.
Hygrophorus cuspidatus Peck, Washington, substrate and locality not indicated.
Hygrophorus eburneus Fries on the ground, Klickitat Co.
Hygrophorus flavodiscus Frost in Peck, on the ground, Klickitat Co.
Hygrophorus gliocyclus Fries on the ground, Klickitat Co.
Hygrophorus variicolor Murrill on the ground, Klickitat Co.
Inocybe mixtilis Britz., sensu Kühner (=*I. trechispora* sensu Kauffman, Bresadola) on the ground, Klickitat Co.
Laccaria laccata (Fries.) Berk. & Broome on the ground, Klickitat and Yakima Cos.
Lactarius scrobiculatus Fries on the ground, Klickitat Co.
Lepiota cristata (Fries) Quélet on the ground, Klickitat Co.
Lepiota flammeatincta Kauffman on the ground, Washington (County not indicated).
Lepiota laevigata Lange on the ground, Klickitat Co.
Lepiota naucina (Fries) Quélet on the ground, Klickitat Co.
Leucopaxillus amarus (Alb. & Schw. ex Fr.) Kühner forma *roseibrunneus* (Murrill) Singer & A. H. Smith on the ground, Klickitat Co.
Limacella solidipes (Peck) H. V. Smith on the ground, Klickitat Co.
Lyophyllum decastes (Fries) Singer on the ground, Klickitat Co.
Marasmius plicatulus Peck on rotting bark of *Pinus* sp., Klickitat Co.
Mycena ?metata (Fries) Quélet on *Tsuga mertensiana,* Mt. Adams.
Mycena vulgaris (Fries) Quélet on the ground, Klickitat Co.
Naematoloma fasciculare (Fries) Karsten on the ground, Klickitat Co.
Naematoloma udum (Pers. ex Fries) Karsten on the ground, Klickitat Co.

Omphalina epichysium (Fries) Quélet on the ground, Klickitat Co.
Omphalina pyxidata (Fries) Quélet on the ground, Klickitat Co.
Panaeolus campanulatus (Fries) Quélet on the ground, Klickitat Co.
Panus rudis Fries on unidentified bark, Klickitat Co.
Pholiota aurivella (Fries) Quélet on *Alnus* sp., Klickitat Co.
Pleurotus niger (Schw.) Sacc. on *Acer macrophyllum,* Klickitat Co.
Pleurotus ostreatus (Fries) Quélet on rotting wood, Klickitat Co.
Psathyrella ?thomii on the ground, Klickitat Co.
Rhodophyllus hirtipes (Fries) Lange on bark of *Pinus* sp., Klickitat Co.
Rhodophyllus sericeus (Fries) Quélet on the ground, Klickitat Co.
Rhodophyllus staurosporus (Bres.) Lange on the ground, Mt. Adams.
Russula delica Fries on the ground, Klickitat Co.
Russula ?rosacea (Pers.) Fries on the ground, Klickitat Co.
Stropharia squamosa (Fries) Quélet var. *squamosa* on the ground, Klickitat Co.
Tricholoma flavovirens (Fries) Lundell on the ground, Klickitat Co.
Tricholoma imbricatum (Fries) Quélet on the ground, Klickitat Co.
Volvaria speciosa (Fries) Gillet on the ground, Klickitat Co.

GASTEROMYCETES

Hymenogastrales

RHIZOPOGONACEAE

The following specimens of *Rhizopogon* are in the Lloyd herbarium. All were hypogaeous under various plants, mostly in coniferous woodlands.

Rhizopogon diplophlocus Zeller & Dodge, Klickitat Co.
Rhizopogon induratus Cke., Klickitat Co.
Rhizopogon occidentalis Zeller & Dodge, Klickitat and Yakima Cos.; Hood River Co., Oregon.
Rhizopogon pachyphloeus Zeller & Dodge, Klickitat Co.
Rhizopogon pannosus Zeller & Dodge, Klickitat Co.
Rhizopogon provincialis Tul., Klickitat Co.
Rhizopogon rubescens Tul., Klickitat Co.
Rhizopogon rubescens Tul. var. *vittadinii* Tul., Klickitat Co.

In addition, the following species is represented in the material at the State College of Washington:

Rhizopogon separabilis Zeller on the ground, Klickitat Co.

Lycoperdales

GEASTRACEAE

Geastrum sp. on the ground, Klickitat Co.
Geastrum delicatus Morg. on the ground, Klickitat Co.
Geastrum floriforme (Vitt.) Cunn. on the ground—Lloyd report.
Geastrum lageniformis Vitt. on the ground, Klickitat Co.
Geastrum minus (Pers.) Cunn. on the ground—Lloyd report.
Geastrum rufescens Pers. on the ground—Lloyd report.
Geastrum saccatus Fr. on the ground—Lloyd report.
Geastrum triplex Jungh. on the ground, Klickitat Co.

LYCOPERDACEAE

Bovista pila Berk. & Curt. on the ground, Klickitat Co.
Bovista plumbea Pers. on the ground, Klickitat Co.
Bovistella dealbata Lloyd on the ground, Klickitat Co.
Calvatia sp. on the ground, Klickitat Co.
Calvatia fragilis (Vitt.) Morgan on the ground, Klickitat Co.
Calvatia gigantea (Batsch. ex Pers.) Lloyd on the ground, Klickitat Co.
Disciseda candida (Schw.) Lloyd on the ground, Klickitat Co.
Disciseda cervina (Berk.) Hollos on the ground, Klickitat Co.
Lycoperdon spp. on the ground, Klickitat and Yakima Cos.
Lycoperdon atropurpureum Vitt. on the ground, Klickitat Co.
Lycoperdon cupricolor Lloyd—Lloyd report.
Lycoperdon sp. on the ground, reported by Lloyd as *L. glaciale* which is a *nomen nudum*. Material was collected near a glacier on Mt. Adams, Yakima Co.
Lycoperdon perlatum Pers. on the ground, Klickitat Co.; Multnomah Co., Ore.
Lycoperdon polymorphum Vitt. on the ground, Klickitat Co.
Lycoperdon pusillum Pers. on the ground—Lloyd report.
Lycoperdon pyriforme Schaeff. ex Pers. on the ground, Klickitat Co.
Lycoperdon subpratense Lloyd on the ground, Klickitat Co.
Lycoperdon umbrinum Pers. on the ground—Lloyd report.

Nidulariales

NIDULARIACEAE

Crucibulum levis (DC.) Kambly on litter, Klickitat and Skamania Cos.
Cyathus striatus Pers. on litter, Klickitat and Skamania Cos.

Nidula candida (Pk.) White on litter, Klickitat Co.; Multnomah Co., Ore.

Nidula emodensis (Berk.) Lloyd on litter—Lloyd report.

SPHAEROBOLACEAE

Sphaerobolus stellatus Tode ex Pers. on litter, Klickitat Co.

Sclerodermatales

ASTRAEACEAE

Astraeus hygrometricus (Pers.) Morgan on the ground, Klickitat Co.

Astraeus pteridis (Shear) Zeller (*Geaster hygrometricus* var. *ganteus* Lloyd) on the ground, Klickitat Co. In the Lloyd herbarium is a specimen in which several fruits are clustered together. This has been assigned the herbarium name var. *caespitosa* by Lloyd.

PISOLITHACEAE

Pisolithus tinctorius (Mich. ex Pers.) Coker & Couch on the ground, Klickitat Co.

SCLERODERMATACEAE

Scleroderma sp. on the ground, Klickitat Co.

Scleroderma geaster Fr.? on the ground, Klickitat Co.

Scleroderma polyrhizum Pers. on the ground, Klickitat Co.

TULOSTOMATACEAE

Tulostoma occidentale Lloyd on the ground—Lloyd report.

FUNGI IMPERFECTI

Phomales

PHOMACEAE

Actinonema rosae Fr. on *Rosa nutkana,* Klickitat Co.

Ascochyta achlyicola Ell. & Ev. on *Achlys triphylla,* Klickitat Co.

Ascochyta colorata Pk. on *Fragaria* sp., Klickitat Co.

Ascochyta vulgaris Kab. & Bub. var. *symphoricarpi* Grove on *Symphoricarpos albus,* Klickitat Co.

Coniothyrium concentricum (Desm.) Sacc. on *Yucca smalliana,* Klickitat Co.

Cornularia sphaeroidea (Ell.) Sacc. on *Arabis lyallii* and *A. suffrutescens,* Yakima Co.

Cytospora chrysosperma (Pers.) Fr. on *Populus trichocarpa,* Klickitat Co.

Cytospora rhoina Fr. on *Rhus diversiloba,* Klickitat Co.
Cytospora salicella Sacc. on *Salix* sp., Klickitat Co.
Cytospora thujae Sacc. & Ell. on *Thuja plicata,* Klickitat Co.
Darluca filum (Biv.) Cast. on *Peridermium* sp.—Ellis report.
Diplodia lupini Cke. & Harkn. on *Lupinus* sp., Klickitat Co.
Diplodia rhoina Cke. & Harkn.—Ellis report.
Haplosporella rumicola (Sacc.) Petrak & Syd. on *Rumex* sp., Klickitat Co.
Hendersonia diplodioides Ell. & Ev. on *Sambucus glauca,* Klickitat Co.
Phoma sp. on *Salix* sp., Klickitat Co.
Phoma lupini Ell. & Ev. on *Lupinus* sp., Klickitat Co.
Phoma nebulosa (Pers.) Mont. on *Arabis ?canescens,* Montana.
Phoma salicina West. on *Salix* sp., Klickitat Co.
Phyllosticta sp. on *Claytonia cordifolia,* Klickitat Co.
Phyllosticta eriogoni W. B. Cooke in Cooke & Shaw on *Eriogonum elatum,* Klickitat Co.
Phyllosticta ferax Ell. & Ev. on *Lupinus* sp., Spokane Co.
Phyllosticta fritillariae Bonar & W. B. Cke. on *Fritillaria lanceolata,* Klickitat Co.
Phyllosticta globigera Sacc. on *Sorbus sitchensis,* Skamania Co.
Phyllosticta heucherae Ell. & Ev. on *Heuchera cylindrica,* Spokane Co.
Phyllosticta hosackiae W. B. Cooke in Cooke & Shaw on *Lotus douglasii,* Klickitat Co.
Phyllosticta minutissima Ell. & Ev. on *Acer glabrum,* Klickitat Co.
Phyllosticta nigrescens W. B. Cooke on *Viola* sp., Skamania Co.
Phyllosticta populina Sacc. on *Populus trichocarpa,* Klickitat Co.
Phyllosticta viridis Ell. & Kell. on *Fraxinus oregona,* Klickitat and Skamania Cos.
Placosphaeria arctostaphyli Ell. & Ev. on *Arctostaphylos nevadensis,* Yakima Co.
Septoria brunellae Ell. & Holw. on *Prunella vulgaris,* Skamania and Yakima Cos.
Septoria saccharini Ell. & Ev. on *Acer glabrum,* Skamania Co.
Septoria sambucina Pk. on *Sambucus glauca,* Klickitat Co.
Septoria toxicodendri Curt. on *Rhus diversiloba,* Skamania Co.
Stagonospora cylindrocarpa (Ell. & Ev.) Sacc. on *Brodiaea howellii,* Klickitat Co.

EXCIPULARIACEAE

Catinula turgida (Fr.) Desm. on *?Corylus californica,* Klickitat Co.

Heteropatella conglutinata (Ell. & Ev.) Nannf. on *Valeriana sitchensis,* Yakima Co.

Heteropatella umbilicata (Pers.) Jaap on *Veratrum californicum,* Yakima Co.

LEPTOSTROMACEAE

Leptostroma caricinum Fr. on *Carex suksdorfii,* Skamania Co.

Leptostroma confluens Cke. on wood, Klickitat Co.

Leptostroma cereale Schw. on *Stipa occidentalis,* Yakima Co.

Leptothyrium litigiosum (Desm.) Sacc. on *Pteridium aquilinum* var. *pubescens,* Klickitat Co.

Leptothyrium rosarum Cke. on Rosa sp., Klickitat Co.

Melasmia menziesii Dearn. & Barth. on *Menziesia ferruginea,* Yakima Co.

Piggotia fraxini Berk. & Curt. on *Fraxinus oregona,* Klickitat Co.

NECTRIOIDACEAE

Sphaeronemella rufa (Fr.) Sacc. on wood, Klickitat and Yakima Cos.

Melanconiales

MELANCONIACEAE

Cylindrosporium ceanothi Ell. & Ev. on *Ceanothus sanguineus* and *C. velutinus,* Klickitat Co.

Cylindrosporium fraxini (Ell. & Kellerm.) Ell. & Ev. on *Fraxinus oregona,* Klickitat Co.

Cylindrosporium heraclei Ell. & Ev. on *Heracleum lanatum,* Yakima Co.

Cylindrosporium smilacinae Ell. & Ev. on *Smilacina racemosa,* Yakima Co.

Cylindrosporium veratrinum Sacc. & Wint. on *Veratrum californicum,* Yakima Co.

Entomosporium thuemenii (Cke.) Sacc. on *Pyrus diversifolia,* Klickitat Co.

Gloeosporium pteridis Harkn. on *Pteridium aquilinum* var. *pubescens,* Klickitat Co.

Gloeosporium ribis (Lib.) Mont. & Desm. on *Ribes* sp., Skamania Co.; *Ribes triste,* Pacific Co.

Gloeosporium rosae Halst. on *Rosa* sp., Klickitat Co.

Gloeosporium salicis West. on *Salix* sp., Klickitat Co.

Marssonina potentillae (Desm.) Magn. on *Potentilla glandulosa,* Klickitat Co.

Marssonina potentillae (Desm.) Magn. var. *fragariae* (Sacc.) Magn. on *Fragaria* sp., Klickitat Co.

Septogloeum oxysporum Sacc. Bomm. & Rouss. on *Glyceria elata,* Yakima Co.

Titaeospora detospora (Sacc.) Bubak on *Equisetum* sp., Spokane Co.

Moniliales

MONILIACEAE

Oidium monilioides Lk. stage of *Erysiphe graminis* on grass, Klickitat Co.

Ramularia aequivoca (Ces.) Sacc. on *Ranunculus* sp., Skamania Co.

Ramularia calthae Lindr. on *Caltha leptosepala,* Yakima Co.

Ramularia castillejae Ell. & Ev. on *Castilleja miniata,* Klickitat Co.

Ramularia claytoniae W. B. Cooke on *Claytonia* sp., Yakima Co.

Ramularia macrospora Fres. var. *asteris* Trel. on *Aster alpigenus,* Yakima Co.

Ramularia mimuli Ell. & Kell. on *Mimulus lewisii,* Yakima Co.; *Mimulus luteus,* Klickitat Co.

Ramularia synthridis W. B. Cooke in Cooke and Shaw on *Synthris reniformis,* Skamania Co.

Ramularia tulasnei Sacc. on *Fragaria* sp., Klickitat Co.

Scolecotrichum graminis Fckl. on *Bromus carinatus,* Klickitat Co.

DEMATIACEAE

Alternaria fasciculata (Ell. & Ev.) Jones & Grout on *Calochortus macrocarpus,* Klickitat Co.

Cercospora cirsii Ell. & Ev. on *Cirsium remotifolium,* Skamania and Yakima Cos.

Cercospora macclatcheana Sacc. & Syd. on *Ceanothus sanguineus,* Skamania Co.; *Ceanothus velutinus,* Klickitat Co.

"*Cladosporium echinulatum* Ell. & Ev." on *Comandra umbellata,* Klickitat Co.

Cladosporium epiphyllum (Pers.) Mart. on *Alnus rubra,* Klickitat Co.

Cladosporium herbarum (Pers.) Lk. on *Agropyron dasystachyum,* Klickitat Co.; *Agrostis rossii,* Yakima Co.; *Apocynum androsaemifolium,* Skamania Co.; *Rosa* sp., Klickitat Co.

Fumago vagans Pers. on *Quercus garryana,* Skamania Co.

Fusicladium depressum (B. & Br.) Sacc. on *Angelica* sp.

"Gonatobotryum sclerotigenum Ell. & Ev." on *Erigeron peregrinus,* Yakima Co. This species was reported in correspondence, but was never published.

"Macrosporium velutinum Ell. & Ev." A specimen was reported by Ellis under this unpublished name. No host or location was indicated.

Polythrincium trifolii Kze. & Schm. on *Trifolium pratense* and *T. repens,* Klickitat Co.

Sporodesmium hysterioideum Cke. & Ell. on wood, Klickitat Co.

Streptothrix sp. on wood, Skamania Co.

Streptothrix abietina Pk. on *Abies grandis,* Klickitat Co.

Torula sp. on *Tulasnella pruinata* on wood, Klickitat Co.

Torula asperula Sacc. on *Pseudotsuga taxifolia,* Klickitat Co.

Verticicladium pulvereum (Pk. & Clint.) Sacc. on *Cornus pubescens* and *Salix scouleriana,* Klickitat Co.

TUBERCULARIACEAE

Epicoccum sp. on *Calochortus macrocarpus,* Klickitat Co.

Strumella coryneoidea Sacc. & Wint. on *Rhus* sp., Klickitat Co.

Tubercularia sp. on wood, Klickitat Co.

Tubercularia vulgaris Tode ex Fr. on *Rhus diversiloba,* Klickitat Co.

Tuberculina jonesii (Pk.) Sacc. on aecia of an unidentified rust, Klickitat Co.

Host Index to Suksdorf's Fungi

This index, arranged alphabetically by host, lists the fungi Suksdorf collected on identifiable substrata. Species found on or under the ground, on litter of various sorts, and on various kinds of unidentified wood and bark are not listed here. In so far as possible, host names are brought into conformity with current usage according to recent floras and monographs.

Abies sp.: *Stictis hysterina, Zignoella diaphana.*

Abies amabilis (Dougl.) Forb.: *Corticium radiosum, Hypoderma robustum, Lophodermium consociatum.*

Abies grandis Lindl.: *Corticium sulphureum, Fomes pinicola, Fuligo septica, Pellicularia vaga, Streptothrix abietina, Trichia botrytis, Uredinopsis macrosperma, U. struthiopteridis.*

Abies lasiocarpa (Hook.) Nutt.: *Corticium* sp., *Crepidotus versutus, Polyporus abietinus, Pucciniastrum goeppertianum.*

Acer circinatum Pursh: *Crepidotus versutus, Daedalea unicolor.*

Acer glabrum Torr.: *Phyllosticta minutissima, Septoria saccharina.*

Acer macrophyllum Pursh: *Corticium* sp., *C. albulum, C. punctulatum, Didymium melanospermum, D. squamulosum, Exidia candida, Hymenochaete cinnamomea, H. spreta, H. tabacina, Hypochnus cervinus, Hypoxylon glomeratum, H. rubiginosum, H. serpens, Lasiosphaeria strigosa, Merulius confluens, M. corium, Odontia* sp., *O. fimbriata, Peniophora cinerea, P. decorticans, P. incarnata, Pleurotus niger, Poria ferrea, P. purpurea, Rhynchostoma tinctum, Rhytisma punctatum, Rosellinia subiculata, Sebacina calcea, Stereum patelliforme, Thyridium lividum.*

Achlys triphylla (Smith) DC.: *Ascochyta achlyicola.*

Actaea arguta Nutt.: *Puccinia rubigo-vera* var. *agropyri.*

Agoseris sp.: *Puccinia hieracii, Sphaerotheca macularis.*

Agoseris glauca (Nutt.) Greene: *Puccinia hieracii, P. suksdorfii.*

Agoseris gracilens (Gray) Greene: *Puccinia hieracii.*

Agoseris heterophylla (Nutt.) Greene: *Sphaerotheca macularis.*

Agropyron sp.: *Puccinia rubigo-vera* var. *agropyri.*

Agropyron dasystachyum (Hook.) Scribn.: *Cladosporium herbarum, Puccinia rubigo-vera* var. *agropyri.*

Agropyron spicatum (Pursh) Scribn. & J. G. Sm.: *Puccinia rubigo-vera* var. *agropyri.*

Agrostis rossii Vasey: *Cladosporium herbarum.*

Alisma sp.: *Doassansia alismatis.*

Allium sp.: *Puccinia granulispora.*

Allium acuminatum Hook.: *Puccinia blasdalei.*

Alnus sp.: *Cenangium* sp., *Diatrypella discoidea* var. *alni, Odontia uda, Peniophora affinis, Pholiota auribella, Physarum mortonii, Polyporus adustus, P. versicolor, Stereum purpureum.*

Alnus rhombifolia Nutt.: *Comatricha suksdorfii, C. typhoides.*

Alnus rubra Bong.: *Cladosporium epiphyllum, Eutypella cerviculata, Phyllactinia guttata.*

Alnus sinuata (Regel) Rydb.: *Cenangium* sp., *Dasyscypha scabrovillosa, Lamproderma physaroides, Phlebia radiata, Physarum serpula.*

Althaea rosea (L.) Cav.: *Puccinia malvacearum.*

Amaranthus graecizans L.: *Albugo blitii.*

Amelanchier sp.: *Gymnosporangium* sp., *Lophodermium maculare.*

Amelanchier alnifolia Nutt: *Apiosporina collinsii, Odontia fimbriata.*

Amsinckia intermedia Fisch. & Mey.: *Erysiphe communis.*

Anaphalis margaritacea (L.) Benth. & Hook.: *Uromyces amoenus.*

Anemone sp.: *Puccinia pulsatillae, P. rubigo-vera* var. *agropyri.*

Anemone oregona Gray: *Dothidea ?anemones, Sphaerella* sp.

Angelica sp.: *Fusicladium depressum.*

Angelica genuflexa Nutt.: *Puccinia ellisii.*

Apocynum androsaemifolium L.: *Cladosporium herbarum.*

Aquilegia formosa Fisch.: *Erysiphe polygoni, Puccinia rubigo-vera* var. *agropyri.*

Arabis canescens Nutt.: *Phoma nebulosa, Puccinia monoica.*

Arabis furcata Wats.: *Albugo candida, Belonium arabicolum, Mycosphaerella tassiana, Puccinia holboellii.*

Arabis lyallii Wats.: *Cornularia sphaeroidea, Puccinia holboellii.*

Arabis suffrutescens S. Wats.: *Cornularia sphaeroidea, Sphaerella* sp.

Arctostaphylos columbiana Piper: *Exobasidium vaccinii-uliginosi.*

Arctostaphylos nevadensis Gray: *Exobasidium vaccinii, Hypoderma tunicatum, Melanomma alpestre, Placosphaeria arctostaphyli, Trichopeziza crossota.*

Arnica chamissonis Less.: *Coleosporium madiae, Entyloma calendulae, Puccinia nuda.*

Arnica cordifolia Hook.: *Entyloma compositarum.*

Artemisia dracunculoides Pursh: *Puccinia absinthii.*

Artemisia rigida (Nutt.) Gray: *Puccinia absinthii.*

Artemisia tridentata Nutt.: *Puccinia absinthii.*

Asarum caudatum Lindl.: *Puccinia asarina.*

Aster alpigenus Gray: *Ramularia macrospora* var. *asteris.*

Aster ledophyllus Gray: *Puccinia extensicola* var. *asteris.*

Aster occidentalis Nutt. var. *intermedius* Gray: *Puccinia extensicola* var. *asteris.*

Astragalus sp.: *Uromyces punctatus.*

Astragalus glareosus Dougl.: *Uromyces punctatus.*

Avena sativa L.: *Ustilago avenae, U. hordei.*

Balsamorhiza deltoidea Nutt.: *Puccinia balsamorhizae.*

Berberis aquifolium Pursh: *Cumminsiella mirabilissima.*

Berberis nervosa Pursh: *Coccomyces dentatus.*

Berberis repens Lindl.: *Cumminsiella mirabillissima.*

Betula glandulosa Michx.: *Melampsoridium betulinum.*
Bidens sp.: *Sphaerotheca macularis.*
Bidens frondosa L.: *Sphaerotheca macularis.*
Brodiaea sp.: *Puccinia dichelostemmae, P. subangulata.*
Brodiaea coronaria (Salisb.) Jeps.: *Puccinia dichelostemmae.*
Brodiaea howellii Wats.: *Puccinia pattersoniana, Stagonospora cylindrocarpa.*
Brodiaea hyacinthina (Lindl.) Baker: *Uromyces brodiaeae.*
Brodiaea puchella (Salisb.) Greene: *Puccinia dichelostemmae, P. subangulata.*
Bromus sp.: *Puccinia rubigo-vera* var. *agropyri, Ustilago bullata.*
Bromus carinatus H. & A.: *Puccinia rubigo-vera* var. *agropyri, Scolecotrichum graminis, Ustilago bullata.*
Bromus ?commutatus Schrad.: *Ustilago bullata.*
Bromus marginatus Nees: *Puccinia rubigo-vera* var. *agropyri.*
Bromus vulgaris (Hook.) Shear: *Ustilago bullata.*
Calamagrostis sp.: *Lophodermium arundinaceum.*
Calochortus sp. *Puccinia calochorti.*
Calochortus lobbii (Baker) Purdy: *Puccinia calochorti.*
Calochortus longebarbatus Wats.: *Puccinia calochorti.*
Calochortus macrocarpus Dougl.: *Alternaria fasciculata, Epicoccum* sp.
Caltha biflora DC.: *Puccinia areolata.*
Caltha leptosepala DC.: *Ramularia calthae.*
Carex spp.: *Cintractia caricis, Puccinia caricis, Sclerotinia sulcata.*
Carex athrostachya Olney: *Uromyces perigynius.*
Carex geyeri Boott.: *Cintractia caricis, Puccinia atrofusca.*
Carex nebraskensis Dewey: *Puccinia caricis.*
Carex rossii Boot.: *Puccinia atrofusca, P. caricis.*
Carex rostrata Stokes: *Puccinia caricis.*
Carex spectabilis Desv.: *Cintractia caricis.*
Carex suksdorfii Kuken: *Leptostroma caricina.*
Cassiope mertensiana (Bong.) Don.: *Exobasidium cassiopes.*
Castilleja miniata Dougl.: *Ramularia castillejae.*
Castilleja ?suksdorfii A. Gray: *Cronartium coleosporoides, Sphaerotheca macularis.*
Ceanothus integerrimus H. & A.: *Corticium punctulatum, Stictis chrysopsis.*
Ceanothus sanguineus Pursh: *Cercospora macclatcheana, Cylindro-*

sporium ceanothi.

Ceanothus velutinus Dougl.: *Cercospora macclatcheana, Clypeosphaeria hendersoniae, Cylindrosporium ceanothi, Dasyscypha* sp.

Centaurea cyanus L.: *Didymium crustaceum, Puccinia cyani.*

Cerastium sp.: *Ustilago duriaeana.*

Chimaphila umbellata (L.) Nutt.: *Pucciniastrum pyrolae.*

Circaea pacifica Asch. & Magn.: *Puccinia circaeae.*

Cirsium lanceolatum (L.) Scop.: *Puccinia cnici.*

Cirsium remotifolium (Hook.)DC.: *Cercospora cirsii, Puccinia cirsii.*

Clarkia rhomboidea Dougl.: *Puccinia oenotherae.*

Claytonia sp.: *Ramularia claytoniae.*

Claytonia cordifolia S. Wats.: *Phyllosticta* sp., *Puccinia mariae-wilsoniae.*

Clematis ligusticifolia Nutt.: *Puccinia rubigo-vera* var. *agropyri.*

Clintonia uniflora (Schult.) Kunth.: *Puccinia mesomajalis.*

Collinsia parviflora Lindl.: *Puccinia collinsiae.*

Collinsia rattanii Gray: *Puccinia collinsiae.*

Collomia grandiflora Dougl.: *Puccinia giliae.*

Comandra pallida A. DC.: *Puccinia comandrae.*

Comandra umbellata (L.) Nutt.: *Cladosporium echinulatum, Cronartium comandrae, Puccinia comandrae.*

Cornus pubescens Nutt.: *Phyllactinia guttata, Verticicladium pulveraceum.*

Corylus californica (A. DC.) Rose: *Catinula turgida, Corticium* sp., *Exidia candida, Gnomoniella coryli, G. vulgaris, Hypoxylon rubiginosum, Irpex owensii, Odontia pinastri, O. setigera, Peniophora cinerea, P. crassa, P. mutata, P. nuda, P. velutina, Radulum* sp., *Solenia anomala, Stereum patelliforme, Tremella* sp.

Crataegus douglasii Lindl.: *Coniophora puteana, Peniophora incarnata, Phyllactinia guttata.*

Crepis acuminata Nutt.: *Puccinia hieracii.*

Cryptantha torreyana (A. Gray) Greene: *Puccinia cryptanthes.*

Cystopteris fragilis (L.) Bernh.: *Hyalopsora polypodii.*

Deschampsia elongata (Hook.) Munro: *Uromyces jacksonii.*

Dodecatheon sp.: *Puccinia ortonii.*

Dodecatheon alpinum (A. Gray) Greene: *Puccinia ortonii.*

Dryopteris phegopteris (L.) C. Chr.: *Hyalopsora aspidotus.*

Echinochloa crus-galli (L.) Beauv.: *Ustilago crus-galli.*

Eleocharis spp.: *Claviceps nigricans, Physoderma eleocharidis, Uromyces eleocharidis.*

Elymus sp.: *Claviceps purpurea, Puccinia rubigo-vera* var. *agropyri, Tilletia elymi.*

Elymus glaucus Buckl.: *Puccinia montanensis, P. rubigo-vera* var. *agropyri, Urocystis agropyri.*

Epilobium sp.: *Puccinia vagans* var. *epilobii-tetragoni, Pucciniastrum pustulatum, Sphaerotheca macularis.*

Epilobium adenocaulon Hausskn.: *Puccinia vagans* var. *epilobii-tetragoni, Pucciniastrum pustulatum.*

Epilobium angustifolium L.: *Pucciniastrum pustulatum.*

Epilobium clavatum Trel.: *Puccinia scandica, Pucciniastrum pustulatum.*

Epilobium coloratum Muhl.: *Puccinia vagans* var. *epilobii-tetragoni, Sphaerotheca macularis.*

Epilobium paniculatum Nutt.: *Puccinia vagans* var. *epilobii-tetragoni, P. veratri, Pucciniastrum pustulatum.*

Equisetum sp.: *Titaeospora detospora.*

Erigeron peregrinus (Pursh) Greene: *Entyloma compositarum, "Gonatobotryum sclerotigenum," Sphaerella subcongregata, Sphaerotheca macularis.*

Eriogonum compositum Dougl.: *Uromyces intricatus.*

Eriogonum elatum Dougl.: *Albugo* sp., *Erysiphe communis, Phyllosticta eriogoni.*

Eriogonum umbellatum Torr.: *Uromyces intricatus.*

Eriogonum vimineum Dougl.: *Uromyces intricatus.*

Erysimum sp.: *Albugo candida.*

Erysimum asperum (Nutt.) DC.: *Albugo candida.*

Erythronium grandiflorum Pursh: *Uromyces heterodermus.*

Erythronium montanum Wats.: *Uromyces heterodermus.*

Euphorbia dictyosperma Fisch. & Mey.: *Uromyces dictyospermae.*

Euphorbia glyptosperma Engelm.: *Uromyces proëminens.*

Euphorbia serpyllifolia Pers.: *Uromyces proëminens.*

Festuca octoflora Walt. var. *tenella* (Willd.) Fern.: *Lophodermium arundinaceum, Ustilago mulfordiana, Tilletia fusca.*

Festuca reflexa Buckl.: *Ustilago mulfordiana.*

Fragaria sp.: *Ascochyta colorata, Marssonina potentillae* var. *fragariae, Ramularia tulasnei.*

Fraxinus oregona Nutt.: *Aleurodiscus* sp., *Coniophora suffocata,*

Corticium sp., *C. albulum, C. contiguum, C. puteanea, C. spretum, Cylindrosporium fraxini, Hysterographium fraxini, Peniophora cinerea, Phyllosticta viridis, Piggotia fraxini, Stereum patelliforme.*

Fritillaria lanceolata Pursh: *Phyllosticta fritillariae, Uromyces muirae.*

Galium aparine L.: *Puccinia difformis.*

Galium triflorum Michx.: *Puccinia punctata.*

Gaultheria ovatifolia A. Gray: *Exobasidium vaccinii.*

Gayophytum sp.: *Puccinia vagans* var. *epilobii-tetragoni, P. vagans* var. *gayophyti.*

Gayophytum caesium Torr. & Gray: *Puccinia vagans* var. *gayophyti.*

Gentiana acuta Michx.: *Uromyces gentianae.*

Geum macrophyllum Willd.: *Erysiphe polygoni.*

Gilia sp.: *Puccinia plumbariae.*

Gilia capitata Sims: *Puccinia plumbariae.*

Glyceria elata (Nash.) Hitchc.: *Septogloeum oxysporum.*

Glycyrrhiza lepidota (Nutt.) Pursh: *Uromyces glycyrrhizae.*

Godetia sp.: *Puccinia oenotherae.*

Godetia epilobioides (Nutt.) Wats.: *Puccinia oenotherae.*

Godetia quadrivulnera (Dougl.) Spach.: *Puccinia oenotherae.*

Goodyera decipiens (Hook.) Hubb.: *Pucciniastrum goodyerae.*

Grass (unidentified): *Oidium monilioides.*

Habenaria sp.: *Aecidium graebnerianum.*

Habenaria dilatata (Pursh) Hook.: *Aecidium graebnerianum.*

Habenaria leucostachys (Lindl.) S. Wats.: *Aecidium graebnerianum.*

Haplopappus bloomeri (Gray) H. M. Hall: *Dasyscypha* sp., *Lamproderma robustum.*

Helianthus annuus L.: *Lachnella* sp., *Puccinia helianthi.*

Heracleum lanatum Michx.: *Cylindrosporium heraclei, Phyllachora heraclei.*

Heuchera cylindrica Dougl.: *Phyllosticta heucherae, Puccinia heucherae.*

Heuchera glabella Torr. & Gray: *Puccinia heucherae.*

Hieracium sp.: *Entyloma calendulae, Puccinia hieracii.*

Hieracium albiflorum Hook.: *Aecidium columbiense, Entyloma compositarum, Puccinia hieracii, Sphaerotheca macularis.*

Hieracium canadense Michx.: *Puccinia hieracii.*
Hieracium gracile Hook.: *Puccinia hieracii.*
Hieracium scouleri Hook.: *Puccinia hieracii.*
Holodiscus discolor (Pursh) Maxim: *Phyllactinia guttata.*
Hordeum brachyantherum Nevski: *Ustilago bullata.*
Hordeum jubatum L. var. *caespitosum* (Scribn.) Hitchc.: *Ustilago bullata.*
Hydrophyllum capitatum Dougl.: *Puccinia rubigo-vera* var. *apocrypta.*
Hydrophyllum tenuipes Heller: *Puccinia rubigo-vera* var. *apocrypta.*
Hypochaeris glabra L.: *Puccinia hieracii.*
Iris missouriensis Nutt.: *Puccinia iridis.*
Juncus sp.: *Sclerotinia juncigena.*
Juncus balticus Willd.: *Uromyces junci.*
Juncus ensifolius Wikstr.: *Uromyces junci-effusi.*
Juncus falcatus E. Mey.: *Uromyces ?junci-effusi.*
Juncus longistylis Torr.: *Uromyces silphii.*
Juncus nevadensis Wats.: *Uromyces junci-effusi.*
Juncus orthophyllus Coville: *Uromyces junci-effusi.*
Lagophylla ramosissima Nutt.: *Puccinia nuda.*
Lathyrus sp.: *Erysiphe communis.*
Lathyrus lanszwertii Kell.: *Uromyces fabae.*
Ligusticum grayi Coult. & Rose: *Nyssopsora echinata, Urophylictis pluriannulata.*
Lilium columbianum Hanson: *Uromyces holwayi.*
Linanthus bicolor (Nutt.) Greene: *Sphaerotheca macularis.*
Linnaea borealis L. var. *americana* (Forbes) Rehder: *Phyllachora wittrockii.*
Lomatium columbianum Math. & Const.: *Puccinia jonesii* var. *jonesii.*
Lomatium dissectum (Nutt.) Math. & Const.: *Puccinia asperior.*
Lomatium nudicaule (Pursh) Coult. & Rose: *Sphaerella* sp.
Lomatium suksdorfii (S. Wats.) Coult. & Rose: *Dothidea reticulata, Pleospora permunda, Puccinia jonesii* var. *jonesii.*
Lomatium triternatum (Pursh) Coult. & Rose: *Puccinia jonesii* var. *jonesii.*
Lonicera sp.: *Lasiobotrys lonicerae.*
Lonicera ciliosa (Pursh) Poir: *Lasiobotrys lonicerae, Micro-*

sphaera penicillata var. *lonicerae.*

Lonicera involucrata (Richards) Banks: *Cenangium* sp., *Microsphaera penicillata* var. *lonicerae, Pleospora vitrispora.*

Lotus douglasii Greene: *Phyllosticta hosackiae.*

Lotus micranthus Benth.: *Erysiphe polygoni.*

Lupinus sp.: *Dasyscypha* sp., *Diplodia lupini, Phoma lupini, Phyllosticta ferax, Pleospora amplispora.*

Lupinus lyallii Gray: *Uromyces occidentalis.*

Lupinus ornatus Dougl.: *Uromyces lupinii.*

Lupinus polyphyllus Lindl.: *Erysiphe polygoni, Uromyces lupini.*

Luzula campestris (L.) DC.: *Puccinia obscura.*

Madia exigua (Smith) Greene: *Spaerotheca macularis.*

Madia sativa Molina: *Coleosporium madiae, Puccinia nuda.*

Malva sp.: *Puccinia malvacearum.*

Malva rotundifolia L.: *Puccinia malvacearum.*

Medicago sativa L.: *Didymium squamulosum, Pseudopeziza medicaginis.*

Mentha arvensis L. var. *canadensis* (L.) Kuntze: *Puccinia menthae.*

Mentha spicata L.: *Puccinia menthae.*

Menziesia ferruginea Sm.: *Melasmia menziesii.*

Mertensia sp.: *Erysiphe communis.*

Mimulus lewisii Pursh: *Ramularia mimuli.*

Mimulus luteus L.: *Ramularia mimuli.*

Mitella sp.: *Puccinia heucherae.*

Mitella breweri Gray: *Puccinia heucherae.*

Mitella diversifolia Greene: *Puccinia heucherae.*

Mitella pentandra Hook.: *Puccinia heucherae.*

Mosses: *Cyphella galeata.*

Muhlenbergia asperifolia (Nees. & Mey.) Parodi: *Tilletia asperifolia.*

Nemophila parviflora Dougl.: *Erysiphe communis, Puccinia rubigovera* var. *apocrypta.*

Oenothera sp.: *Puccinia oenotherae.*

Oryzopsis exigua Thurb.: *Lophodermium arundinaceum.*

Osmorhiza chilensis Hook. & Arn.: *Puccinia pimpinellae.*

Oxalis suksdorfii Trel.: *Microsphaera russellii.*

Oxyria digyna (L.) Hill: *Ustilago vinosa.*

Paeonia brownii Dougl.: *Euryachora stellaris.*

Pentstemon nemorosus (Dougl.) Trautv.: *Erysiphe polygoni, Puccinia chelonis.*

Peridermium sp.: *Darluca filum.*

Phacelia circinata Jacz.: *Puccinia rubigo-vera var. apocrypta.*

Phalaris arundinacea L.: *Ustilago macrospora.*

Philadelphus sp.: *Sebacina calcea.*

Phleum pratense L.: *Ustilago striiformis.*

Phlox sp.: *Puccinia plumbaria.*

Phlox diffusa Benth.: *Erysiphe communis, Puccinia douglasii.*

Phlox douglasii Hook.: *Puccinia plumbaria, Pyrenophora coronata.*

Phlox gracilis (Hook.) Greene: *Puccinia plumbaria, Sphaerotheca macularis.*

Phoenicaulis cheiranthoides Nutt.: *Puccinia monoica.*

Phyllodoce empetriformis D. Don.: *Exobasidium* sp.

Pinus sp.: *Marasmius plicatulus, Rhodophyllus hirtipes.*

Pinus albicaulis Engelm.: *Comatricha suksdorfii, Dasyscypha arida, Hysterographium formosum, Lophium mytilinum, Neopeckia coulteri, Tympanis pithya.*

Pinus contorta Dougl. var. *latifolia* Engelm.: *Arcyria versicolor, Coleosporium solidaginis, Comatricha suksdorfii, Corticium* sp., *C. bisporum, C. corruge, Cronartium coleosporioides, Hemitrichia stipitata, Hymenochaete fimbriata, Merulius bellus, Peniophora affinis, P. cremea, P. luna, P. pulvinata, P. subalutacea, Prototrichia metallica, Stereum sanguinolentum.*

Pinus monticola Dougl. ex Lamb.: *Lophodermium nitens.*

Pinus ponderosa Dougl.: *Ceratiomyxa fruticulosa, Coniophora olivacea, Corticium* sp., *C. albulum, C. bisporium, Dacrymyces abietinus, Gymnopilus liguiritiae, Hypochnus pannosus, Lophodermium pinastri, Pellicularia issabellinus, Peniophora cremea, P. glebulosa, P. tenuis, Phlebia albida, Polyporus abietinus, Poria spissa, Stemonitis flavogenita, Stereum sanguinolentum.*

Poa pratensis L.: *Erysiphe graminis, Puccinia poae-sudeticae.*

Poa vaseyochloa Scribn.: *Puccinia poae-sudeticae.*

Polemonium sp.: *Phyllachora ?polemonii.*

Polemonium occidentale Greene: *Synchytrium* sp.

Polygonum sp.: *Puccinia amphispilusa, P. polygoni-amphibii, Ustilago bistortarum.*

Polygonum aviculare L.: *Uromyces polygonii.*

Polygonum bistortoides Pursh: *Puccinia bistortae.*

Polygonum hydropiperoides Michx.: *Ustilago utriculosa.*

Polygonum natans (Michx.) Eaton: *Puccinia polygoni-amphibii, Uromyces polygoni.*

Polygonum newberryi Small: *Puccinia bistortae, Ustilago punctata.*

Polypodium glycyrrhiza D. C. Eaton: *Milesia laeviuscula.*

Polypodium hesperium Maxon: *Milesia laeviuscula.*

Populus sp.: *Clitocybe* sp., *Crepidotus fulvifibrillosus, C. haustellaris, C. versutus, Lycogola epidendrum, Peniophora cinerea, Perichaena depressa, Uncinula salicis.*

Populus tremuloides Michx.: *Aleurodiscus roseus, Ciborinia bifrons, Corticium porosum, Melampsora albertensis.*

Populus trichocarpa Torr. & Gray: *Caliciopsis ellisii, Corticium albulum, C. porosum, Cytospora chrysosperma, Helotium* sp., *H. amplum, H. salicellum, Melampsora occidentalis, Peniophora affinis, Phyllosticta populina, Sebacina plumbescens, Taphrina populi-salicis.*

Potamogeton sp.: *Doassansia martianoffiana.*

Potentilla flabellifolia Hook.: *Phragmidium biloculare.*

Potentilla flabelliformis Lehm.: *Phragmidium ivesiae.*

Potentilla glandulosa Lindl.: *Marssonina potentillae.*

Potentilla gracilis Dougl.: *Phragmidium ivesiae.*

Prunella vulgaris L.: *Linospora brunellae, Septoria brunellae, Sphaerotheca macularis.*

Prunus demissa (Nutt.) Walp.: *Podosphaera clandestina.*

Prunus emarginata (Dougl.) Walp.: *Calosphaera principes, Grandinia corrugata, Hymenochaete tabacina.*

Pseudotsuga taxifolia (Lam.) Britton: *Blytridium signatum, Corticium punctulatum, C. sulphureum, Fomes pinicola, Hymenochaete tabacina, Poria vulgaris, Torula asperula, Tympanis pinastri.*

Pteridium aquilinum (L.) Kühn. var. *pubescens* Underw.: *Corticium* sp.. *Gloeosporium pteridis, Leptothyrium litigiosum, Phyllachora ?flabella, Uredinopsis macrosperma.*

Purshia tridentata (Pursh) DC.: *Peniophora cinerea, Stereum patelliforme.*

Pyrola bracteata Hook.: *Chrysomyxa pyrolae.*

Pyrola secunda L.: *Pucciniastrum pyrolae.*

Pyrus diversifolia Bong.: *Entomosporium thuemenii, Phyllactinia guttata.*

Quercus sp.: *Gnomonia setacea.*

Quercus garryana Dougl.: *Arcyria occidentalis, Badhamia nitens, Coniophora puteana, Corticium lactescens, Didymium anellus, D. clavies, Fuligo septica, Fumago vagans, Hymenochaete badio-ferruginea, H. curtisii, Mycoacia himantia, Peniophora affinis, P. cinerea, P. cinerea* var. *papyracea, P. decorticans, P. incarnata, Physarum alpinum, P. mortonii, Poria crassa, Radulum concentricum, Stereum hirsutum.*

Ranunculus sp.: *Enyloma ranunculi, Ramularia aequivoca.*

Ranunculus flammula L. var. *ovalis* (Bigelow) L. Benson: *Erysiphe communis.*

Ranunculus glaberrimus Hook. var. *ellipticus* Greene: *Puccinia rubigo-vera* var. *agropyri.*

Ranunculus hebecarpus Hook. & Arn.: *Puccinia rubigo-vera* var. *agropyri.*

Ranunculus occidentalis Nutt.: *Entyloma ranunculi, Puccinia rubigo-vera* var. *agropyri.*

Ranunculus ?uncinatus D. Don: *Entyloma ranunculi.*

Rhododendron albiflorum Hook.: *Exobasidium burtii.*

Rhus sp.: *Strumella coryneoidea.*

Rhus diversiloba Torr. & Gray: *Cytospora rhoina, Diatrype rhois, Lachnella corticalis, Nectria cinnabarina, Odontia setigera, Peniophora cinerea, P. decorticans, P. incarnata, Septoria toxicodendri, Stereum patelliforme, Tubercularia vulgaris.*

Ribes sp.: *Gloeosporium ribis.*

Ribes divaricatum Dougl.: *Odontia setigera, Peniophora nuda, Puccinia caricis* var. *grossulariata.*

Ribes lacustre (Pers.) Poir: *Puccinia parkerae.*

Ribes laxiflorum Pursh: *Helotium virgultorum.*

Ribes triste Pallas: *Gloeosporium ribis.*

Ribes watsonianum Koehne: *Corticium* sp.

Rosa sp.: *Cladosporium herbarum, Gloeosporium rosae, Leptothyrium rosarum, Phragmidium ?montivagum, P. rosae-californicae.*

Rosa gymnocarpa Mitt.: *Phragmidium montivagum, P. rosae-californicae.*

Rosa nutkana Presl.: *Actinonema rosae, Corticium* sp., *C. bisporum, Diderma trevalyani, Phragmidium disciflorum, P. rosae-californicae, Stereum hirsutum, S. patelliforme.*

Rosa pisocarpa Gray: *Phragmidium speciosum.*

Rubus leucodermis Dougl.: *Phragmidium rubi-idaei.*

Rubus parviflorus Nutt.: *Dasyscypha scabrovillosa, Phragmidium occidentale.*

Rumex sp.: *Haplosporella rumicicola.*

Salix sp.: *Badhamia utricularis, Cenangium tryblidioides, Corticium* sp., *C. albulum, C. bisporum, C. bombycinum, Cytidia salicina, Cytospora salicella, Diderma trevalyani, Gloeosporium salicis, Helotium amplum, H. salicellum, Hymenochaete tabacina, Hypoxylon rubiginosum, Lachnella hyalina, Lasiobelonium subflavidum, Lophidium trifidum, Melampsora bigelowii, M. ribesii-purpureae, Melanomma cupulata, Odontia fimbriata, O. pinastri, Orbilia eucalypti, Peniophora affinis, P. incarnata, Phoma* sp., *P. salicina, Rhytisma salicinum, Solenia anomala, Stereum hirsutum, Stictis pachyspora, Tapesia fusca, Tulasnella pruinata.*

Salix amygdaloides Anders.: *Melampsora bigelowii.*

Salix lasiandra Benth.: *Fomes igniarius, Stereum hirsutum.*

Salix scouleriana Barratt: *Uncinula salicis, Verticicladium pulveraceum.*

Salvia sp.: *Didymium melanospermum.*

Sambucus glauca Nutt.: *Corticium* sp., *Hendersonia diplodioides, Pellicularia vaga, Peniophora incarnata, Sebacina calcea, Septoria sambucina.*

Sanicula menziesii Hook. & Arn.: *Urophlyctis pluriannulata.*

Satureja douglasii (Benth.) Briq.: *Puccinia menthae.*

Saxifraga sp.: *Pleospora vulgaris, Puccinia heucherae.*

Saxifraga arguta D. Don: *Puccinia heucherae.*

Saxifraga bracteosa Suks.: *Puccinia heucherae.*

Saxifraga ?fragosa Suks.: *Puccinia heucherae.*

Saxifraga mertensiana Bong.: *Puccinia heucherae, P. pazschkei.*

Saxifraga ?occidentalis Wats.: *Puccinia heucherae.*

Saxifraga oregana Howell: *Puccinia heucherae.*

Scirpus microcarpus Presl.: *Puccinia mcclatchieana.*

Secale cereale L.: *Puccinia rubigo-vera var. secalis.*

Selaginella ruprestris (L.) Spring.: *Acrospermum urceolatum.*

Senecio sp.: *Entyloma calendulae.*

Senecio hydrophiloides Rydb.: *Coleosporium occidentale.*

Senecio hydrophilus Nutt.: *Erysiphe communis, Puccinia subcircinata.*

Senecio triangularis Hook.: *Coleosporium occidentale, Puccinia subcircinata.*

Sidalcea sp.: *Puccinia interveniens.*

Silene heterophylla: *Sphaerotheca macularis.*

Silene ?macounii S. Wats.: *Ustilago clintoniana.*

Silene oregana Wats.: *Uromyces suksdorfii.*

Silene pacifica Eastw.: *Uromyces suksdorfii.*

Sisymbrium officinale (L.) Scop.: *Albugo candida.*

Sisyrinchium douglasii A. Dietr.: *Uromyces probus.*

Sitanion hystrix (Nutt.) J. G. Sm.: *Ustilago spegazzini* var. *agrestris.*

Smilacina racemosa (L.) Desf.: *Cylindrosporium smilacinae.*

Smilacina stellata (L.) Desf.: *Tubercinia trientalis.*

Solidago canadensis L.: *Coleosporium solidaginis.*

Sorbus occidentalis (S. Wats.) Greene: *Gymnosporangium nelsonii.*

Sorbus sitchensis Roem.: *Gymnosporangium juniperinum, Phyllosticta globigera.*

Spiraea douglasii Hook.: *Podosphaera clandestina.*

Spraguea umbellata Torr.: *Uromyces spragueae.*

Stellaria borealis Bigel: *Melampsorella cerastii.*

Stephanomeria minor Nutt.: *Puccinia harknessii.*

Stephanomeria paniculata Nutt.: *Puccinia harknessii.*

Stipa comata Trin. & Rupr.: *Ustilago nummularia.*

Stipa occidentalis Thurb.: *Hysterium* sp., *Leptostroma cereale.*

Stipa thurberiana Piper: *Ustilago williamsii.*

Streptopus curvipes Vail.: *Tuburcinia trientalis.*

Symphoricarpos albus (L.) Blake: *Ascochyta vulgaris* var. *symphoricarpi, Puccinia crandallii, P. symphoricarpi.*

Synthris reniformis Benth.: *Ramularia synthridis.*

Taraxacum sp.: *Puccinia hieracii.*

Tellima grandiflora (Pursh) Dougl.: *Puccinia heucherae.*

Thalictrum sp.: *Puccinia rubigo-vera* var. *agropyri, Tranzschelia thalictri.*

Thuja plicata Donn.: *Cytospora thujae, Licea variabilis, Prototrichia metallica, Trichia botrytis.*

Tiarella unifoliata Hook.: *Puccinia heucherae.*

Tofieldia occidentalis S. Wats.: *Hypoderma commune, Leptosphaeria* sp.

Tonella tenella (Benth.) Hel.: *Puccinia collinsiae.*
Trautvetteria grandis Nutt.: *Puccinia pulsatillae.*
Trientalis latifolia Hook.: *Sphaerella* sp.
Trifolium ciliatum Nutt.: *Uromyces minor.*
Trifolium ?dubium Sibth.: *Uromyces minor.*
Trifolium microcephalum Pursh: *Erysiphe polygoni.*
Trifolium oliganthum Steud.: *Uromyces minor.*
Trifolium pratense L.: *Polythrincium trifolii.*
Trifolium repens L.: *Polythrincium trifolii, Uromyces trifolii* var. *trifolii-repentis.*
Triticum aestivum L.: *Erysiphe graminis, Puccinia graminis, Tilletia caries.*
Tsuga mertensiana (Bong.) Sarg.: *Anthostomella brachystoma, Blytridium signatum, Comatricha suksdorfii, Dacrymyces chrysocomus, Lasiosphaeria stuppea, Mycena ?metata, Odontotrema minor, Physarum citrinum, Stereum sulcatum.*
Tulasnella pruinata Bourd. & Galz.: *Torula* sp.
Vaccinium sp.: *Exobasidium vaccinii, E. vaccinii-uliginosi.*
Vaccinium caespitosum Michx.: *Pucciniastrum goeppertianum, P. myrtilli.*
Vaccinium membranaceum Dougl.: *Dasyscypha* sp., *Exobasidium vaccinii, E. vaccinii-uliginosi, Pucciniastrum goeppertianum, P. myrtilli, Tapesia fusca, Trichopeziza coarctata.*
Valeriana sitchensis Bong.: *Heteropatella conglutinata, Lamproderma robustum, "Peziza elongata," "P. prorumpens," Synchytrium* sp.
Valerianella congesta Lindl.: *Aecidium valerianellae.*
Veratrum sp.: *Puccinia veratri.*
Veratrum californicum Durand: *Cylindrosporium veratrinum, Heteropatella umbilicata, Heterosphaeria linariae, Lamproderma robustum, Lepidoderma carestianum, Puccinia veratri, Sporodinia grandis, Trichopeziza setigera.*
Veronica wormskjoldii R. & S.: *Puccinia albulensis.*
Vicia americana Muhl.: *Uromyces coloradensis, U. fabae.*
Vicia americana var. *linearis* (Nutt.) S. Wats.: *Uromyces coloradensis.*
Viola sp.: *Phyllosticta nigricans, Puccinia violae.*
Viola adunca Smith: *Puccinia violae.*
Viola glabella Nutt.: *Puccinia violae.*

Viola praemorsa Dougl.: *Puccinia effusa, Sphaerotheca macularis.*
Xerophyllum tenax (Pursh) Nutt.: *Leptosphaeria hysterioides.*
Yucca smalliana Fenn.: *Coniothyrium concentricum.*

Literature Cited

Cooke, W. B. 1951. Some Myxomycetes from South Central Washington. Northwest Science 25: 171-175.

Ellis, J. B., and B. M. Everhart. 1884. New Species of Fungi from Washington Territory collected by W. N. Suksdorf during the summer and fall of 1883. Bull. Wash. Col. Lab. Nat. Hist. 1: 3-6.

Jackson, H. S. 1922. New or Noteworthy Rusts on Carduaceae. Mycologia 14: 104-120.

Seaver, F. J. 1951. The North American Cup-Fungi. (Inoperculates). New York. 428 pp., illus.

Weber, W. A. 1944. The Botanical Collections of Wilhelm N. Suksdorf. 1850-1932. Res. Stud. State Coll. Wash. 12: 51-121.

Acknowledgments

The writers wish to thank Marion Ownbey for making Suksdorf's fungi available for study; to thank Dr. Ownbey and Mrs. E. F. Gaines for assistance in interpreting Suksdorf's habitat notes and location codes and for assistance in determining many of the higher plants; to thank Gerald B. Ownbey for making available the Suksdorf material in the Holway Herbarium; and to thank the curators of the Farlow Herbarium, the mycological herbarium at the New York Botanical Garden, and the Lloyd Mycological Collections for permission to study Suksdorf specimens in the Burt, Ellis, and Lloyd collections.

Host binomials were originally supplied in most cases by Suksdorf. In addition to our identifications, Suksdorf fungi have also been identified by J. C. Arthur, E. A. Burt, G. W. Clinton, B. O. Dodge, J. B. Ellis, John Erikson, G. W. Fischer, E. W. D. Holway, J. W. Hotson, H. S. Jackson, J. Lowe, C. G. Lloyd, J. H. Miller, R. Petrak, W. H. Snell, R. Sprague, D. E. Stuntz, and H. Sydow. However, the writers assume responsibility for the records contained herein, since it has been necessary to substitute binomials in current use for both fungi and hosts in numerous instances.

EVIDENCE OF COMPLEX PHYSIOLOGICAL HETEROTHALLISM IN *USTILAGO STRIIFORMIS HORDEI*[1]

GEORGE W. FISCHER
Professor of Plant Pathology

INTRODUCTION

The stripe smut of grasses caused by *Ustilago striiformis* (West-end.) Niessl is a widespread and often destructive species. In North America 70 species in 23 genera of grasses have been recorded as hosts (Fischer, 1953). Many important forage grasses are among these hosts. Of these, severe and destructive prevalence of stripe smut has been recorded repeatedly on Kentucky bluegrass (*Poa pratensis* L.), redtop (*Agrostis alba* L.), and timothy (*Phleum pratense* L.) by Pammel (1893), Griffiths (1903), Clinton (1900), Osner (1916), Kreitlow and Meyers (1944), Leach, *et al.* (1946), Wellhausen, *et al.* (1946), and others. Quite naturally then, the disease has attracted considerable attention and many contributions have been made toward an understanding of the life history and parasitism of the casual fungus. Literature references to these have recently been compiled by Fischer (1951). One of the most interesting aspects of the life history of the stripe smut fungus, and one that has received attention only in comparatively recent years, is that of heterothallism and sex.

In 1940, as part of a general contribution (Fischer, 1940a) on the life history of the stripe smut of grasses, the sexual phenomena were described. It was shown that in the *"forma hordei"* [on grasses of the tribe *Hordeae,* and probably better designated as variety *hordei* (Fischer & Shaw, 1953)], the sporidia are unisexual and represent one or the other of two sex groups. When sporidia of opposite sex are in juxtaposition, especially on non-nutrient agar, they fuse in pairs within a few hours. From each fused pair there arises, most frequently from the copulation tube, a long, vigorous, aerial infection hypha. In 1947 a preliminary report was published (Fischer, 1947) confirming that only two sex groups could be detected within

[1] Scientific Paper No. 1188, Washington Agricultural Experiment Stations, Pullman. Cooperative investigations of the Department of Plant Pathology, Washington Agricultural Experiment Stations; and the United States Department of Agriculture, the latter represented by the Division of Forage Crops, Bureau of Plant Industry, Soils and Agricultural Engineering and the Soil Conservation Service, Division of Nurseries. Work done under Project 451.

any one collection of stripe smut, whether or not the monosporidial cultures demonstrating this came from the same or from different single spores. However, when monosporidial cultures representing different collections were mated in all possible combinations on water agar, a more complex type of sex relationships was revealed. Instead of only two sex groups, several were indicated. The present paper gives the complete details of these observations which seem definitely to indicate the existence of multiple sex types in this smut fungus.

MATERIALS AND METHODS

In this study, 24 collections of *Ustilago striiformis hordei* were used. These were from species of *Agropyron* and *Elymus*, chiefly in the western states. From 38 germinating spores representing these collections, 261 monosporidial cultures were obtained. Most of the work, however, centered around 46 monosporidial cultures, repesenting 12 collections. The data on these collections are given in Table 1.

TABLE 1. COLLECTION DATA FOR 12 COLLECTIONS OF *USTILAGO STRIIFORMIS HORDEI* USED FOR SEXUALITY STUDIES

Collection No.	Host	Locality	Other Data
2	Agropyron trachycaulum	Pullman, Wash.	1940 S.C.S. Nurseries[1]
3	Agropyron trachycaulum	Bozeman, Mont.	1941
4a	Elymus glaucus	Pullman, Wash.	1941 S.C.S. Nurseries
11	Elymus canadensis	Kalispel, Mont.	1941
13	Elymus canadensis	Billings, Mont.	1941
36	Elymus canadensis	Pullman, Wash.	1940 S.C.S. Nurseries
37	Agropyron trachycaulum	Salt Lake City, Utah	1940
41	Agropyron inerme	Pullman, Wash.	1941 S.C.S. Nurseries
44	Agropyron trachycaulum	Pullman, Wash.	1941 S.C.S. Nurseries
48a	Elymus canadensis	Pullman, Wash.	1941 S.C.S. Nurseries
68	Agropyron trachycaulum	Union, Ore.	1943
78	Elymus virginicus	Clarke Co., Ky.	1943 Collected by John R. Hardison

[1] All the Pullman, Wash., collections came from the observational row nurseries of the Pullman Nursery Unit of the Soil Conservation Service, United States Department of Agriculture. Since these observational rows represented seed collections from a wide area of the western states, greater geographic distribution of the smut collections is thus represented than would at first appear, since in all probability the smut in these rows came from inoculum brought in on the seed. Seed transmission was clearly indicated in the earlier studies (Fischer, 1940a).

As explained in an earlier paper (Fischer, 1940a), germination in the *"forma hordei"* of *Ustilago striiformis* is such that it is not possible to obtain pedigreed monosporidial cultures (i.e., arising from sporidia from known cells of the promycelium as in many species of *Ustilago*). The cultures were obtained by isolating individual sporidia from very young colonies arising from single germinating spores, with the aid of a Chambers micro-manipulator. Three to 13 (usually 6 to 10) sporidia were thus isolated from each germinating spore. The resulting colonies were numbered in the order of isolation. The germinating spores from which the sporidia were isolated were likewise given a number, beginning with the number 5. Thus, culture 36-58 arose from the eighth sporidium isolated from germinating spore No. 5 of collection No. 36, on *Elymus canadensis* (Table 1).

Sporidia of monosporidial cultures arising from each germinating spore were mated on water agar in all possible combinations with each other. Likewise, each culture was "selfed" by merely smearing a small portion of a recent transfer of the culture over a small area of a poured plate of water agar. Sixteen pairings or selfs were accommodated on each 100 mm. Petri plate by marking off the bottom of the plate in eight sectors and dividing these into two each by a ring marked off within the area of the bottom of the plate. Each sector was numbered, 1-16. In all cases fresh, vigorous colonies of the cultures were used. The matings were accomplished by transferring pinhead-size portions of the appropriate cultures to their respective sector on the plate and thoroughly mixing these with the aid of a sterile nichrome wire loop, spreading the mixture of sporidia rather thinly.

The matings and selfs were examined after at least four hours, but it was soon learned that overnight was better. By this time, if the paired cultures were of opposite sex reaction, fusion usually had long since occurred and the resulting characteristic, long, infection hyphae were in abundance. Such positive reactions were recorded as "+." Where no sporidial fusions and infection hyphae occurred the reaction was regarded as negative "—" and the cultures involved were considered as of the same sex type. Fig. 1, for example, shows the results of the pairing of 10 monosporidial cultures of Collection 44, all from the same germinating spore.

Matings of monosporidial cultures from different collections were accomplished in the same manner.

EXPERIMENTAL RESULTS

Only brief study is required of Fig. 1 to see that of the 10 monosporidial cultures from spore No. 5 of Collection 44, two sex groups are represented. Half of the cultures belong to one group and half to the other. Thus, cultures 51, 52, 55, 57, and 58 are of one sex group and 53, 54, 56, 59, and 510 belong to the other.

		Monosporidial culture No.									
		51	52	55	57	58	53	54	56	59	510
	51	—	—	—	—	—	+	+	+	+	+
	52	—	—	—	—	—	+	+	+	+	+
	55	—	—	—	—	—	+	+	+	+	+
	57	—	—	—	—	—	+	+	+	+	+
Monosporidial	58	—	—	—	—	—	+	+	+	+	+
culture No.	53	+	+	+	+	+	—	—	—	—	—
	54	+	+	+	+	+	—	—	—	—	—
	56	+	+	+	+	+	—	—	—	—	—
	59	+	+	+	+	+	—	—	—	—	—
	510	+	+	+	+	+	—	—	—	—	—

FIG. 1. Sex reaction of 10 monosporidial cultures from the same germinating spore of *Ustilago striiformis*, Collection 44 (from *Agropyron trachycaulum*), mated in all possible combinations. (+ indicates sporidial fusions and infection hyphae in abundance; — indicates no reaction, i.e., no fusions, no infection hyphae.)

In most of the 38 sets of monosporidial cultures from single germinating spores, two sex groups were indicated in each set from any given collection. However, the distribution was seldom equal as in the case of the No. 5 series from Collection 44 (Fig. 1). In fact, of the 38 sets of monosporidial cultures, in only three were the two sexes equally represented. In the others the distribution ranged from slightly less than equal (e.g., 3:4, 3:5, 1:3) to a very uneven distribution (1:10, 2:11, 1:9) or even to where only one sex appeared to be represented (0:7, 0:8).

The question arose as to the relationship of the sex pattern in one set of cultures to those of another set, particularly if they represent different collections or different hosts. For a study of this, 12 sets of monosporidial cultures containing lines of opposite sex were selected on the basis of diversity of geographic distribution and host

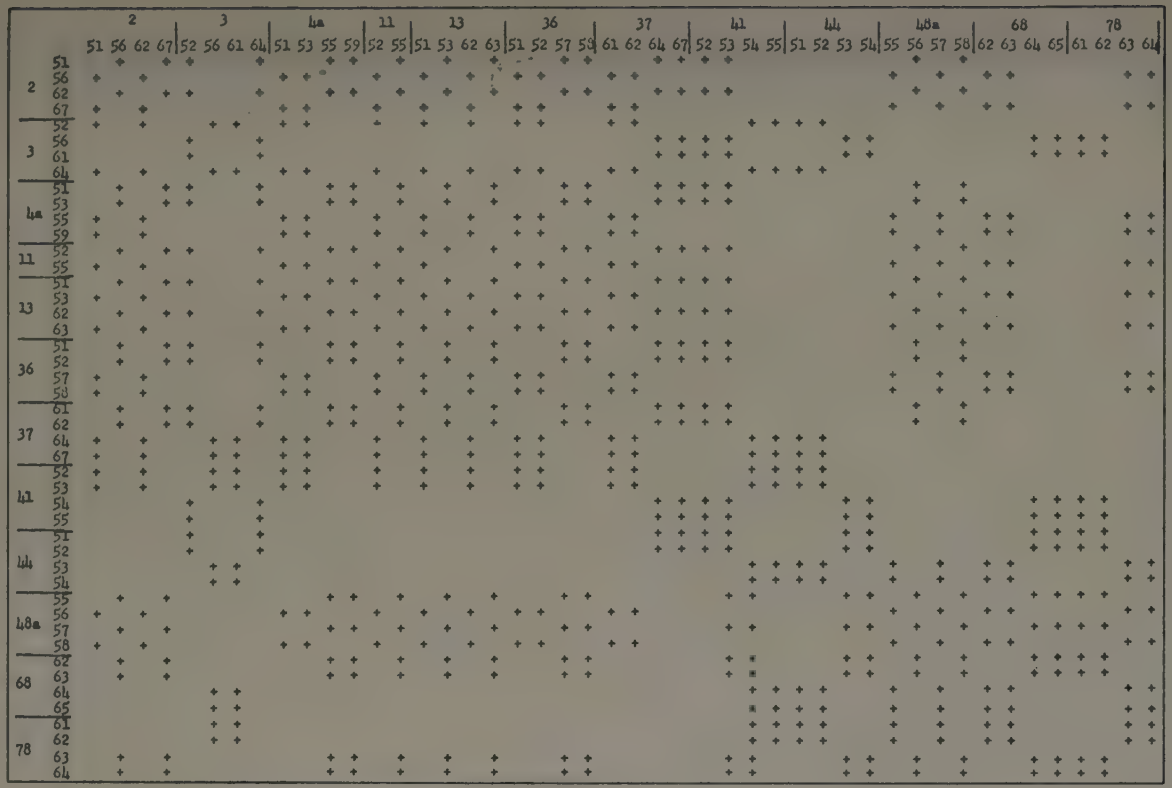


Fig. 2. Results of pairing 46 monosporidial cultures of *Ustilago striiformis hordei* in all possible combinations. (The inside two-digit numbers are culture numbers; the outside numbers refer to collections, for which see Table 1.) Positive sexual reactions, as evidenced by abundant sporidial fusions and subsequent aerial infection hyphae, are indicated as +.

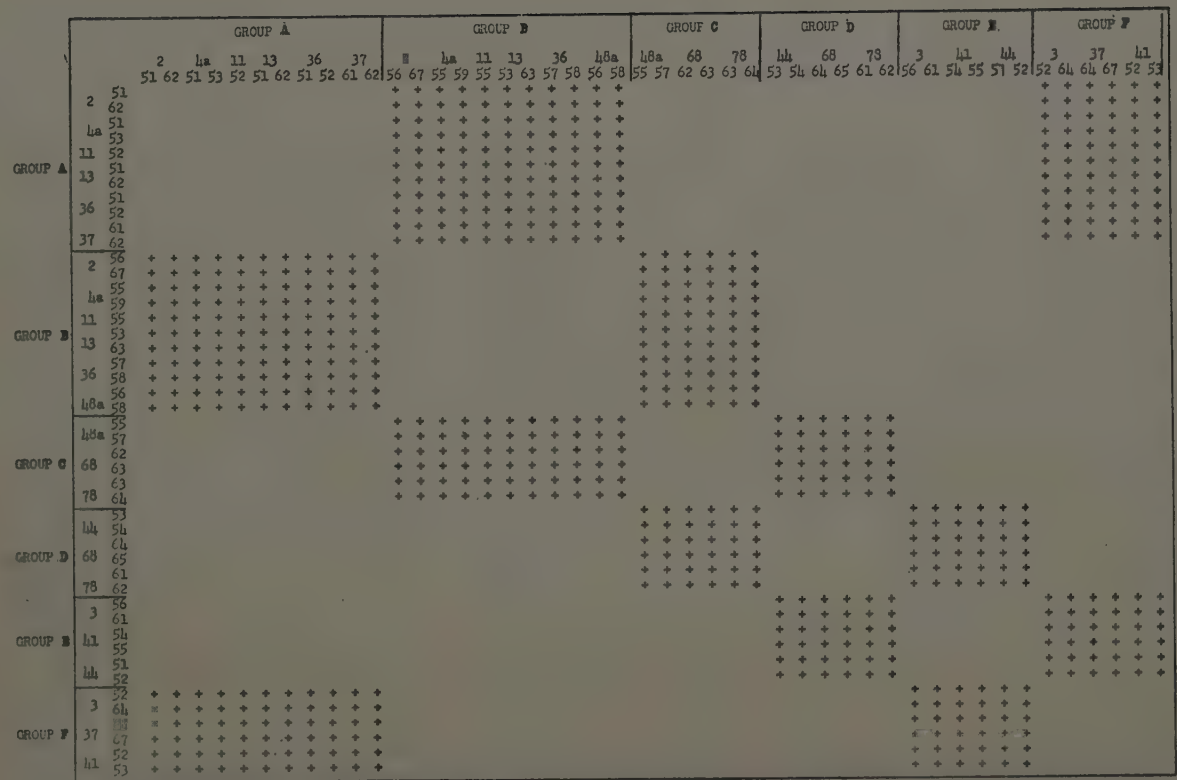


Fig. 3. Compatibility pattern obtained when the cultures in Fig. 2 are rearranged according to similarity of reaction, showing six distinct sex groups.

range. In 11 of the chosen sets the number of cultures was reduced to four, two of each sex. In a twelfth set only one culture of one of the sex types was obtained, so only one culture of the other sex type was used. These 46 monosporidial cultures were mated in all possible combinations, for a total of 2116 pairings. Actually, by this procedure all matings were performed in duplicate.

It was obvious in the data obtained from this mating experiment that sex relationships in *Ustilago striiformis hordei* are more complex than the simple two factor type reported earlier (Fischer, 1940a). When the positive reactions were tabulated (Fig. 2), six sex groups could be distinguished among the 46 monosporidial cultures. When all cultures of each reaction class were grouped together, as in Fig. 3, the six groups were readily apparent. Groups A and B are represented by six collections and 11 cultures each, while the other four groups are represented by three collections and six cultures each. Each group is compatible with two other groups. This inter-group compatibility is reduced to its simplest terms in Fig. 4. Of the 21 possible group pairings, there are only 6 compatible combinations: AB, AF, CB, CD, DE, EF.

		Group					
		A	B	C	D	E	F
Group	A	—	+	—	—	—	+
	B		—	+	—	—	—
	C			—	+	—	—
	D				—	+	—
	E					—	+
	F						—

FIG. 4. Inter-compatibility pattern of six sex groups in *Ustilago Striiformis.*

In view of the quite different picture obtained in this more detailed study of sexuality in *Ustilago striiformis,* as contrasted with that obtained earlier (*op. cit.*) when only 9 monosporidial cultures from one germinating spore were studied, it seemed desirable to study the behavior of *U. striiformis* cultures when mated with similar cultures of some other graminicolous smut. In the earlier report on the life histoy of *Ustilago striiformis* (*op. cit.*), it was shown that sporidia of this smut and *U. bullata* Berk. are intercompatible, al-

though some compatible combinations of the two species resulted in more profuse development of infection hyphae. Twenty-three monosporidial cultures of *U. bullata,* representing four collections and three pathogenic races as differentiated by Fischer (1940b), were paired in all possible combinations with the 46 cultures of *U. striiformis.* The results are presented in Figs. 5 and 6.

In Figs. 5 and 6 it is seen that the 46 cultures of *Ustilago striiformis hordei* maintained their sex group identity when mated with the cultures of *U. bullata.* The data further indicate three sex groups among the 23 cultures of *U. bullata*: one group compatible with Groups A, C, and E of *U. striiformis*; a second group compatible with Groups B, D, and F; and a third group not compatible with any of the *U. striiformis* cultures.

DISCUSSION AND CONCLUSIONS

The foregoing data provide substantial evidence of the existence of multiple sex groups in *Ustilago striiformis hordei* and add this species to the list of several smut fungi for which this phenomenon has already been demonstrated. These are adequately reviewed by Whitehouse (1951) and also by Vaheeduddin (1942), who described multiple sexes in *Sphacelotheca sorghi* (Link) Clint. In this species, however, Vaheeduddin (*op. cit.*) was able to detect as many as four sex groups in the monosporidial isolates from a single germinating spore. Since in each case he was dealing with four pedigreed cultures representing definite cells of the promycelium, it follows that a different sex group was isolated from each of the four promycelial cells. When six such sets of cultures were paired in all combinations possible, it was found that every one of the 24 cultures represented a different sex group. Carrying the study farther, Vaheeduddin (*op. cit.*) paired, in all combinations possible, 74 monosporidial cultures isolated from 28 germinating spores of *S. sorghi* and obtained evidence of at least 60 sex groups. This represents the extreme of multiple sex groups as reported in any of the smut fungi.

The use of the term "sex" in describing these phenomena is admittedly loose. In some circles the term is restricted to organisms having gametangia and/or gametes that differ morphologically and can be differentiated as male and female. If "sex" is to be used only where definite male and female individuals and/or organs can be differentiated, probably some other term should be applied to or-

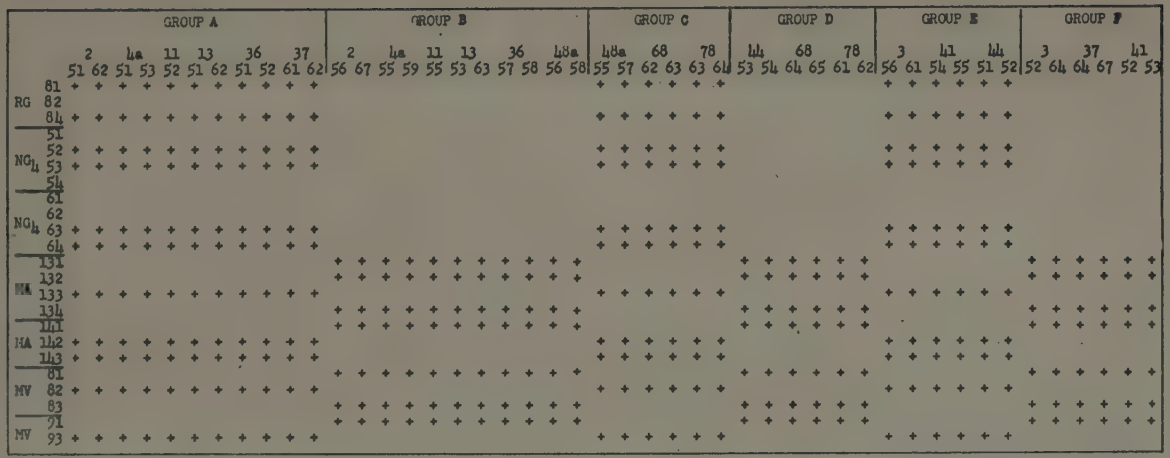


Fig. 5. Results of pairing the 46 cultures representing six sex groups in *Ustilago striiformis hordei* in all possible combinations with 23 cultures of *U. bullata,* representing four collections and three pathogenic races: R-G = Race—1 from *Sitanion jubatum* J. G. Sm.; N-G_4 = Race 2, from *Elymus glaucus* Buckl.; M-A = Race 2, from *Bromus tectorum* L.; M-V = Race 5, from *Bromus purgans* L.

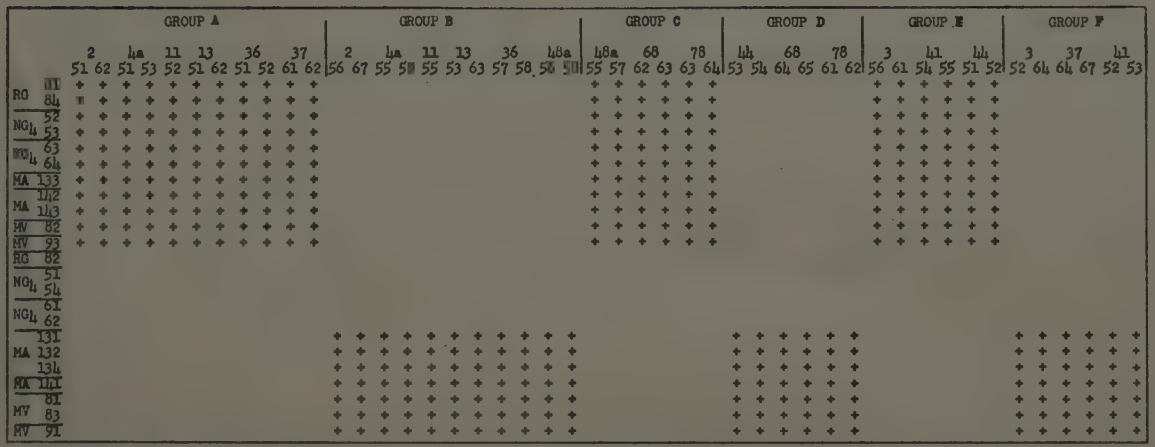


Fig. 6. Compatibility pattern obtained when the cultures of *Ustilago bullata* mated with *U. striiformis* (see Fig. 5) are rearranged according to similarity of reaction.

ganisms like the smut fungi. Some mycologists have used such terms as "compatibility group," "sexual phase," "mating type," etc. Most writers, however, seem to have avoided a definition of "sex" *per se*. "Sexual reproduction," according to Alexopolous (1952), "in fungi as in other living organisms involves the union of two compatible nuclei," and consists of three distinct phases: plasmogamy, karyogamy, and meiosis. By this definition, there can be no doubt of sexual reproduction in the smut fungi; but there does remain considerable doubt as to the validity of the term "sex" as applied to the two or more groups of haplonts which differ in their sexual compatibility with other groups of haplonts. Certainly there are no criteria for differentiating male and female elements. Another complicating feature is the existence of not merely two sex groups in the smut fungi but numerous groups in some species. In general then, it would seem better to reserve the term "sex" for strictly male and female connotation, with consistent morphological distinctions. The multiple factor phenomenon exhibited in many smut fungi and in certain of the Hymenomycetes and Gasteromycetes merits a different terminology. This applies also to the use of such terms as "dioecious" and "heterothallic."

Blakeslee (1904), who originated the term "heterothallism," believed that each mycelium of an heterothallic species is unisexual and that "+" and "−" strains represent two sexes (at least in the Mucorales, in which order Blakeslee studied these phenomena). Because Blakeslee considered homothallic and heterothallic to correspond respectively with monoecious and dioecious, subsequent botanists have tended to use the term "dioecious" as synonymous with heterothallic. As shown by Whitehouse (1949), some students of sexual phenomena in the fungi have proposed that the term "dioecious" be applied to the condition in which there is separation of the sexes on different individuals, and the term "heterothallic" be restricted to those species in which there is no morphological difference betwen the strains. However, Whitehouse (*op. cit.*) also shows why this distinction is not tenable. He, therefore, proposes the term "morphological heterothallism" for sexual reproduction occurring only through the association of two thalli which differ in sex; i.e., in the morphology of their gametes or gametangia so that one can be regarded as male and the other as female. He further proposes the term "physiological heterothallism (haploid incompatibility)" for

sexual reproduction occurring only through the association of two thalli which differ physiologically, but which show no constant morphological differences in their gametes or gametangia, such as amount to a difference in sex. Such thalli are said to differ in "mating type." These two distinctions appear sound and logical; the smut fungi obviously exhibit "physiological heterothallism" and the term "mating type" is quite applicable to what has earlier been called sexes, sex groups, compatibility groups, etc.

More recently, Whitehouse (1951) has critically reviewed the various reports and demonstrations of heterothallism in the smut fungi. He took issue with all claims of anything more complex than simple + and − heterothallism in this group of the fungi on the thesis that such claims "are in every instance based on faulty reasoning and cannot be substantiated," and "a negative result for a test for mating-type need not necessarily imply that the pair of cultures investigated are sexually incompatible, since genetic or environmental factors causing weak pathogenicity, or preventing conjugation of spores on agar, or preventing the subsequent development of aerial mycelium, may invalidate the test." Whitehouse lays great stress on the possibility of sterility or incompatibility genes, and it must be admitted that these could exist and exert an influence directly antagonistic to compatibility factors. Apparently Whitehouse (1951) overlooked Vaheeduddin's demonstration (1942) of a complex of 60 compatibility groups or mating types in *Sphacelotheca sorghi*. It is difficult for the writer to understand how these 60 mating types could be reduced to simple + and − heterothallism by the simple expedient of assuming that "A gene which . . . suppresses the development of aerial mycelium in compatible cultures[2] would thus resemble in its effects a second locus controlling heterothallism, unless it be accepted that a negative result for a mating-type test does not necessarily imply that the spores or cultures are sexually incompatible." Nevertheless, Whitehouse's hypothesis constitutes a substantial challenge to determine if indeed there may be genes for weak pathogenicity, for sterility, or for compatibility, which have, as he contends, led us astray in our interpretations of sexual manifestations in the smut fungi.

[2] Whitehouse's "aerial mycelium" refers to the development of the dicaryotic aerial infection hyphae or "suchfäden" (Bauch, 1932) characteristically developing in abundance from matings of cultures of opposite compatibility type.

At any rate it seems certain that sex in the smut fungi is relative. In the present studies, in those of Vaheeduddin (1942) and others (reviewed by Whitehouse, 1951), the mating of monosporidial cultures from the different germinating spores gave a more complex picture of sexuality than was obtained by mating cultures from the same spore. In the present report on sexuality in *Ustilago striiformis* one cannot help wondering if multiple compatibility groups would have been detected if the 46 monosporidial cultures had originated from a single collection of the smut instead of from 12 collections. In some of these collections the cultures used did represent two germinating spores (see Fig. 2), and yet in no instance was there any indication of more than two compatibility groups represented in the same collection. Undoubtedly, the number of compatibility strains detected in any species will also often depend on the sampling as represented by the number of monsporidial cultures used. Thus, when Vaheeduddin (1942) used only sets of four cultures from single germinating spores, he detected two, three, or four compatibility strains. When he used 24 cultures, from six germinating spores, each culture proved to be of a different mating type; and when 74 cultures from 28 spores were employed, 60 mating types or compatibility groups came to light. That there was a direct correlation of positive mating reaction with pathogenicity was proved when he injected a random sample of compatible combinations into sorghum seedlings with smut resulting in every case. None resulted from incompatible combinations. In the writer's studies of *U. striiformis* and in similar studies of other species of smut fungi (reviewed by Whitehouse, 1951), only two mating groups could be detected as long as only cultures from the same germinating spore were used; but a greater number of cultures, representing more spores or more collections, revealed that, collectively, several to many mating or compatibility groups are contained within the species.

There did not appear to be any concentration of compatibility groups on any of the grass species represented in these studies of *Ustilago striiformis.* Thus Group A occurs on *Agropyron trachycaulum, Elymus canadensis,* and *E. glaucus*; Group B occurs on the same species; Group C occurs on *A. trachycaulum, E. canadensis,* and *E. virginicus* (and from widely separated geographic localities); Group D was found on *A. trachycaulum* and *E. virginicus* (likewise geographically separated); Groups E and F came from *A. trachycaulum* and *A. inerme.*

SUMMARY

The sexuality of *Ustilago striiformis hordei* was studied as represented by 261 monosporidial cultures from a total of 38 germinating spores representing 24 collections of the smut from *Agropyron* and *Elymus* spp. From each germinating spore, three to 13 monosporidial cultures were obtained, usually six to eight.

When the cultures from any one germinating spore were mated in all possible combinations, it was found that there were, in most cases, two compatibility groups represented. In no case could more than two groups be detected from any one germinating spore, and, in several cases, only a single compatibility group appeared to be represented. In only three of the 38 sets of monsporidial cultures were the two groups equally represented among the cultures.

Forty-six of the monosporidial cultures (representing two of each of the two compatibility groups in each of 11 collections of *Ustilago striiformis hordei* and one of each group in a 12th collection) were mated on plain water agar in all possible combinations. The pattern exhibited by this experiment demonstrated the existence of at least six compatibility groups in this variety of *U. striiformis*. Each group is compatible with two other groups.

When the same 46 cultures of *Ustilago striiformis hordei* were mated in all possible combinations with 23 monosporidial cultures of *U. bullata* (representing four collections and three pathogenic races), it was found that the *U. striiformis hordei* cultures maintained their compatability group identity. The results also indicated three compatibility groups among the *U. bullata* cultures: one group compatible with A, C, and E of *U. striiformis hordei*; one compatible with B, D and F (*ibid.*); and a third group not compatible with any of the stripe smut cultures.

The general philosophy of sex in the smut fungi is discussed. It is concluded that although these studies and previous ones of a similar nature by others do undoubtedly pertain to sexual reproduction, the various sex groups in the different species should not be designated as "sexes"; at least not in the sense of male and female. Rather, they should be thought of as compatibility groups or mating types.

LITERATURE CITED

Alexopolous, C. J. 1952. Introductory mycology. xiv + 482 pp. John Wiley and Sons, New York.

Bauch, Robert. 1932. Die Sexualität von Ustilago scorzonerae und Ustilago zeae. Phytopath. Zeitschr. 5: 315-322.

Blakeslee, A. F. 1904. Zygospore formation a sexual process. Science 19: 864-866.

Clinton, G. P. 1900. The smuts of Illinois' agricultural plants. Ill. Agric. Expt. Sta. Bull. 57.

Fischer, George W. 1940a. Fundamental studies of the stripe smut of grasses (Ustilago striaeformis) in the Pacific Northwest. Phytopath. 30: 93-118.

Fischer, George W. 1940b. Host specialization in the head smut of grasses, Ustilago bullata. Phytopath. 30: 991-1017.

Fischer, George W. 1947. Multiple sex factors in Ustilago striiformis f. hordei. Phytopath. 37: 843-844.

Fischer, George W. 1951. The smut fungi. A guide to the literature, with bibliography. x + 387 pp. Ronald Press Co., New York.

Fischer, George W. 1953. Manual of the North American smut fungi. (in press) Ronald Press Co., New York.

Fischer, George W., and Charles Gardner Shaw. 1953. A proposed species concept for the smut fungi with application to North American species. Phytopath. 43: (in press).

Griffiths, David. 1903. Forage conditions and problems in eastern Washington, eastern Oregon, northeastern California and northwestern Nevada. United States Dept. Agric., Bur. Pl. Indus. Bull. No. 38.

Kreitlow, K. W., and W. M. Meyers. 1944. Prevalence and distribution of stripe smut of Poa pratensis in some pastures of Pennsylvania. Phytopath. 34: 411-415.

Leach, J. G., C. L. Lowther, and Mary A. Ryan. 1946. Stripe smut (Ustilago striaeformis) in relation to bluegrass improvement. Phytopath. 36: 57-72.

Osner, George A. 1916. Leaf smut of timothy. Cornell Univ. Agric. Expt. Sta. Bull. 381.

Pammel, L. H. 1893. Notes on some fungi common during the season of 1892. Agric. Sci. 7: 22-23.

Vaheeduddin, Syed. 1942. The pathogenicity and genetics of some sorghum smuts. Minn. Agric. Exp. Sta. Tech. Bull. 154.

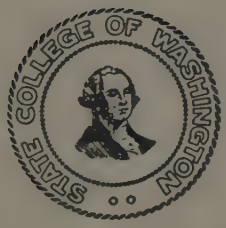
Wellhausen, E. J., K. W. Kreitlow, and J. G. Leach. 1946. Observations on the prevalence and economic importance of stripe smut (Ustilago striiformis) on bluegrass. Plant Dis. Reptr. 27: 23-24.

Whitehouse, H. L. K. 1949. Heterothallism and sex in the fungi. Biol. Rev. Cambridge Phil. Soc. 24: 411-447.

Whitehouse, H. L. K. 1951. A survey of heterothallism in the Ustilaginales. Trans. Brit. Mycol. Soc. 34: 340-355.

RESEARCH STUDIES
OF THE
STATE COLLEGE OF WASHINGTON

Volume XX 1952



Published at The State College of Washington
Pullman, Washington

RESEARCH STUDIES

of the

STATE COLLEGE OF WASHINGTON

EDITOR
PAUL BECKETT*
Associate Professor of Public Administration

ACTING EDITOR
HOWARD C. PAYNE
Assistant Professor of History

WALLIS BEASLEY
Associate Professor of Sociology

CHARLES D. CAMPBELL
Professor of Geology

FRED A. DUDLEY
Professor of English

ADOLPH HECHT
Associate Professor of Botany

Entered as second-class matter December 26, 1936, at the post office at Pullman, Washington, under Act of August 24, 1912.

Research Studies of the State College of Washington is published in Pullman, Washington, by the State College of Washington. It is issued four times a year—in March, June, September, and December.

PURPOSE. *Research Studies* is a medium of publication for articles of research in the pure sciences and arts. Its pages are open to the faculty and advanced students of the State College of Washington. One issue each year is devoted to papers read by members of the Pacific Sociological Society at its annual convention. Suitable articles by other persons are accepted whenever space is available.

MANUSCRIPTS. Submit manuscripts to Howard C. Payne, Room 429, Todd Hall, Pullman, Washington. Though no strict limit is set as to the maximum number of pages or the nature or number of illustrations, authors are reminded that the papers must be actual research, and that conciseness is desirable. Authors who will assume the expense may arrange for the inclusion of extra pages, tables, or illustrations.

SUBSCRIPTIONS. *Research Studies* will be mailed postpaid to subscribers for three dollars a year. Subscriptions are payable in advance to *Research Studies*, the State College of Washington, Pullman, Washington, U.S.A.

EXCHANGE. *Research Studies* is offered in exchange to other colleges, universities, learned societies, and libraries. Publications sent in return should be addressed to the Exchange Department, Library, the State College of Washington, Pullman, Washington, U.S.A. At present, all back numbers and title pages can still be supplied.

SINGLE NUMMBERS. Single numbers will be sold or exchanged as long as available; orders should be addressed to *Research Studies*, the State College of Washington, Pullman, Washington, U.S.A. For prices of back numbers (with the list of articles of each number), see pages 63-64 of the March, 1951, issue (Vol. XIX, No. 1). The price of the present number is one dollar.

* On leave, 1951-53.

CONTENTS AND INDEX OF VOL. XX. (1952)

Page

Beem, Helen P., Comrey, Andrew L., Pfiffner, John M., and *Wilson, Robert C.:* Predicting Effective Organizations 58

Briggs, Dennie L.: Social Characteristics Associated With Ethnocentric Scores of Naval Recruits 47

Cooke, Wm. Bridge, and *Shaw, Charles Gardner:* Notes on Alaskan Fungi 15

Cooke, Wm. Bridge, and *Shaw, Charles Gardner:* The Suksdorf Fungus Collections, Part I 135

Daugherty, Richard D., and *Dammel, Eugene A.:* Preliminary Excavations of a Burial Site on the Snake River 122

Dodd, Stuart C., and staff: Testing Message Diffusing in C-Ville.. 83

Fischer, George W.: Some New Species of Ustilaginales From North America 3

Fischer, George W.: Tilletia Brevifaciens Sp. Nov., Causing Dwarf Bunt of Wheat and Certain Grasses 11

Grosshans, Henry: Karl Marx and the French Sections: Conflict in the First International 146

Jaynes, Bryson L.: Public Attitudes Toward Teachers 164

Merriam, Willis B.: Some Observations on "The Plow vs. The Trap" in the Historical Geography of the Pacific Northwest.... 112

Nisbet, Robert A.: Social Structure and Social Change 70

Reeder, Leo G.: The Central Area of Chicago— A Re-Examination of the Process of Decentralization 53

Short, James F., Jr.: A Social Aspect of Business Cycle Re-Examined: Crimes 36

Stone, Carol M., and *Landis, Paul H.:* An Approach to Authority Pattern in Parent-Teenage Relationships..... 63

Swanson, Howard S., and *Haer, John L.:* The Application of Two Guttman Techniques in the Prediction of Some Political Activities 64

Topping, C. W.: Methodological Problems in Canadian Research on the Prediction of Marital Success 42

Wager, L. Wes: The Measurement of the Job Satisfaction of Professional Nurses 77

Wallin, Paul: Two Conceptions of the Relation Between Love and Idealization 21

Willey, Dale H.: Moral Meaning in The Ring and The Book: Three Symbols and an Allegory 93

PRICE LIST OF SEPARATE NUMBERS
RESEARCH STUDIES of the STATE COLLEGE OF WASHINGTON

The prices of the following four issues have been changed as follows: Vol. II, No. 4, $1.00; Vol. III, Nos. 1 and 2, $1.00 each; Vol. IV, Nos. 3-4, $2.50. For all other issues, the original prices still apply.

Vol. I:

No. 1, The Source of the Swauk Placers, by *John Prentiss Thomson;* Permeability of the Intestinal Mucosa to Native Fecal Bacteria, by *LaVerne Almon Barnes;* The Flowering and Fruiting Habits of Lomatium, by *Edith Hardin;* Plants of the Headwaters of the St. John River, Maine, by *Harold St. John;* New and Noteworthy Northwestern Plants, Part 2, by *Harold St. John,* 64 pp., 4 figs., 3 pl. Price ..... $ .75

No. 2, Validity Studies of Objective Tests, by *Cliff Winfield Stone;* Teratologic Forms of Trillium ovatum and Trillium petiolatum, by *Rocelia Catherine Palmer*; Eriogonum composition and Its Variations, by *Harold St. John & Fred A. Warren;* New and Noteworthy Northwestern Plants, Part 3, by *Harold St. John,* 48 pp., 4 figs. 2 pl. Price ..... $ .50

No. 3, The Moss Flora of Southeastern Washington and Adjacent Idaho, Part 1, by *George Neville Jones,* 40 pp., map, Price ..... $ .50

No. 4, The Moss Flora of Southeastern Washington and Adjacent Idaho, Part 2, by *George Neville Jones,* 40 pp. Price ..... $ .50

Vol. II:

No. 1, Cytology of Triticum, Secale and Aegilops Hybrids with Reference to Phylogeny, by *Hannah C. Aase,* 60 pp., 27 figs. Price ..... $ .75

No. 2, The Japanese Exclusion Bill of 1924, by *Earl H. Pritchard;* Genetic Characters in Relation to Chromosome Numbers in a Wheat Species Cross, by *F. J. Stevenson;* Morphological Study of Bulb and Flowers of Camassia quamash (Pursh) Greene, by *Anne Maclay Leffingwell,* 28 pp., 3 figs. Price ..... $ .40

No. 3, The Upward Movement of Inorganic Solutes in plants, by *Harry F. Clements;* Studies in Local Immunity, by *L. A. Barnes;* New and Noteworthy Northwestern Plants, by *Harold St. John,* 28 pp., 4 figs. 1 pl., 1 map. Price ..... $ .40

No. 4, Dryden's Influence on the Versification of *Lamia,* by *Charles A. Langworthy;* New and Noteworthy Plants of the Pacific Northwest, by *George Neville Jones;* Lessing and English Domestic Tragedy, by *Paul P. Kies,* 32 pp., 1 fig. Price $1.00

Vol. III:

No. 1, Auto-antibody Production for Bone Marrow, by *Victor Burke, Cloyce F. Bradley, and N. P. Sullivan*; Flora of Redwood Peak, Oakland Hills, California, by *Lincoln Constance*; Salt Tolerance of *Ruppia maritima* in Lakes of High Magnesium Sulphate Content, by *Elisabeth M. McKay*; The Fungous Flora of Normal Apples, by *Glenn A. Huber*; The Inheritance of Resistance to Physiologic Forms of *Tilletia levis* and *T. tritici,* and the Effect of Temperature on Pathogenicity, by *William K. Smith*; Nitrogen in Relation to Composition, Growth, and Yield of Wheat, by *L. D. Doneen*; Investigations on the Etiology and Control of the Blue-Mold Decay of Apples Caused by *Penicillium expansum* Link, by *Kenneth F. Baker,* 36 pp., Price $1.00

No. 2, Petrarch and the Physicians, by *Don Cameron Allen*; Some Notes on Fielding's Plays, by *Emmett L. Avery*; The Authorship of "Die Englische Schaubuehne," by *Paul P. Kies*; On the Dating of *Othello* and *Lear,* by *Paul P. Kies,* 40 pp., Price $1.00

Vol. IV:

No. 1, The Genus *Arabis* L. in the Pacific Northwest, by *Reed C. Rollins*; The Electrolysis of Aqueous Solutions of Sodium and Zirconyl Sulfates, by *Henry B. Linford*, 56 pp., 15 fig. Price.....$ .65

No. 2, The Problem of Parole, Part I, by *Carl I. Erickson*; The Historical Geography of the Eastern Boundary of Rhode Island, by *Edward L. Ullman*; Downy Mildew of Peas Caused by *Peronospora pisi* (Deb.) Syd., by *Leo Campbell*, 36 pp., 4 fig. Price.....$ .50

Nos. 3-4, The Crucial Years of Early Anglo-Chinese Relations, 1750-1800, by *Earl H. Pritchard*, 352 pp., 7 fig. Price.....$2.50

Vol. V:

No. 1, Studies in Drought Resistance of the Soy Bean, by *Harry F. Clements*; Language of Institutional Delinquents, by *Paul Fendrick*; The Effects of Continued Application of Irrigation Water and Commercial Fertilizers to Ephrata Fine Sand in the Wenatchee Orchard District, by *Carl A. Larson*; Henry VIII and the Imperial Election of 1519, by *Harold E. Blinn*; Rest Period Responses and Cold Resistance in the Red Raspberry in Relation to the Breeding of Hardy Varieties, by *Chester Druse Schwartze*; The Making of the *Shepheardes Calender*, by *Roland B. Botting*, 64 pp., 5 plates. Price.....$ .75

No. 2, Vaudeville on the London Stage, 1700-1737, by *Emmett L. Avery*; A Study of Certain Reactions of the Apple to Soil Moisture and Meteorological Conditions, by *Lawrence Leonard Claypool*; Decomposition Potentials of Fused Salts, by *Roy C. Kirk*; Studies in the Drought Resistance of the Sunflower and the Potato, by *Harry F. Clements*; Fungi Which Cause Decay of Apples in Cold Storage, by *Geo. D. Ruehle*; Physiological and Genetical Studies on Delayed Germination in *Avena*, by *LeRoy P. V. Johnson*; Biology and Control of the Douglas-Fir Beetle *Dendroctonus Pseudotsugae* Hopkins (Coleoptera - Scolytidae) with Notes on Associated Insects, by *William Delles Bedard*; Supplement—A Short-Title Catalogue of Books Prior to 1700 in the Library of the State College of Washington, by *Don Cameron Allen*, 64 pp., 8 plates. Price.....$ .75

No. 3, The Creation and Dissolution of the Danish-Swedish Alliance of 1628, by *Francis J. Bowman*; Byron's Interest in the Americas, by *B. R. McElderry, Jr.*; The Policy of the American State Department toward Missionaries in the Far East, by *Harold J. Bass*, 64 pp., 1 pl. Price.....$ .75

No. 4, Browning and the Victorian Public in 1868-69, by *B. R. McElderry, Jr.*; The Utilization of Apple Waste and Preparation of New Products from Apples, by *Harold W. Gerritz*; A Text from Nashe on the Latin Literature of the Sixteenth Century, by *Don C. Allen*; The Effect of Certain Potato and Tobacco Viruses on Tomato Plants, by *Grover Burnett*, 32 pp. Price.....$ .50

Vol. VI (1938):

No. 1, Mechanisms of Freezing Resistance in the Needles of *Pinus ponderosa* and *Pseudotsuga mucronata*, by *Harry F. Clements*; Fielding's *Universal Gallant*, by *Emmett L. Avery*; An Ecological Study of Kamiak Butte, by *Lowell A. Mullen*, 48 pp., 11 plates. Price.....$ .50

No. 2, The Problem of Parole, Part II, by *Carl I. Erickson*; The Inheritance of Reaction to Physiologic Races of *Tilletia tritici* (Bjerk.) Wint. in a Winter Wheat Cross, by *Alva M. Schlehuber*; Reaction of Winter Wheat to Physiologic Races of *Tilletia levis* Kühn and *T. tritici* (Bjerk.) Wint., by *Alva M. Schlehuber*; Oxidation-Reduction Potentials of Arsenate-Arsenite Systems in Sand and Soil Mediums, by *Clark M. Keaton*; The Interfacial Tensions of Some Mercury-Hydrocarbon Oils, by *Fritz A. Hedman*, 56 pp., 3 fig. Price.....$ .60

No. 3, Delinquency Areas in Spokane, Washington, by *H. Ashley Weeks* and *Margaret G. Smith*; A Comparison of an English Test and a Psychological Examination at the College Level, by *Newton Jesse Aiken*; A Possible Source of Lessing's *Horoskop*, by *Paul P. Kies*, 24 pp., Price.....$ .35

No. 4, Pioneer Social Adaptation in the Palouse Country of Eastern Washington, 1870-90, by *Fred R. Yoder*; The Number of Unincorporated Places in the United States and Their Estimated Populations, by *Paul H. Landis*, 60 pp., Price.....$ .70

Vol. VII (1939):

No. 1. Christopher Smart in London, by *Roland B. Botting*; An Addition to the Canon of Stephen Crane, by *Lyndon U. Pratt*; The French Labor Movement 1880-95, by *Harold E. Blinn.* 72 pp. Price.....$ .75

No. 2. Victorian Evaluation of *The Ring and the Book*, by *B. R. McElderry, Jr.*; *The Craftsman* of July 2, 1737, and Colley Cibber, by *Emmett L. Avery*; Armor and Weapons in the Middle English Romances, by *Robert W. Ackerman.* 48 pp. Price.....$ .50

No. 3. Social Adapatation and Lag of the Rural Church in Whitman County, Washington, by *Fred R. Yoder*; The Preparation of Galacturonic and Mucic Acids from Pectic Substances, by *Hugh H. Mottern*; Viroses of the Garden Pea (*Pisum sativum* L.) in Washington, by *Folke Johnson*; Studies on the Control of Blue-Mold Decay of Apples, by *Richard Wellman*; New or Otherwise Noteworthy Northwestern Plants—III, by *Carl W. Sharsmith.* 40 pp. Price.....$ .50

No. 4. Birds of the Upper Peninsula of Michigan, by *Leonard Wing*; Studies of the Relationships of Some Features of Wheat Glumes to Resistance to Shattering and of the Use of Glume Strength as a Tool in Selecting for High Resistance to Shattering, by *Orville A. Vogel*; The Stage Popularity of *The Rehearsal*, 1671-1777, by *Emmett L. Avery.* 48 pp. Price.....$ .50

Vol. VIII (1940):

No. 1. The Role of Intelligence in Human Affairs, by *Glenn E. Hoover*; The Radio as a Social Institution, by *Martin H. Neumeyer*; Political Behavior of the American-Born Japanese, by *Forrest E. LaViolette*; The Sociology of War, by *George M. Day*; The Position of the Jewish Community in the Economy of Detroit, by *Henry J. Meyer*; The Nature of News, by *Carl F. Reuss*; The Mennonites of Yamhill County, Oregon, by *William C. Smith, Victoria Fuqua, Paul Louie*; The Teaching of Sociology in the Secondary Schools, by *Duane Robinson*; Migratory Farm Labor in the Western States, by *Paul H. Landis*; Emile Durkheim's Contribution to the Problem of the Social Order, by *John M. Foskett*; The Democratic Ideology of the Sociologists Ward and Cooley, by *Elton F. Guthrie*; Certain Social Processes among Social Welfare Agencies, by *Samuel H. Jameson*; A Study in the Deterrent Effect of Capital Punishment, by *Robert H Dann*; Recent Trends in Minnesota Politics, by *Calvin F. Schmid*; Minutes of the Business Session of the Eleventh Annual Meeting of the Pacific Sociological Society. 80 pp. Price.....$ .80

No. 2. Two Scribal Errors in *Guy of Warwick*, by *Robert W. Ackerman*; Pioneer Social Adaptation in Northeastern Washington, by *Fred R. Yoder.* 32 pp. Price.....$ .40

No. 3. A Sudden Development in Keats's Poetic Method, by *Walter F. Wright;* Some Circulatory Anomalies in the Fetal Pig, by *Ronald F. MacLennan;* Taxonomic and Pathogenicity Studies of the Fungi Which Cause Decay of Pears in Washington, by *W. Harley English*; The State of Matter at a Solid-Liquid Interface, by *Lester L. Winter.* 20 pp. Price.....$ .30

No. 4. An Ecological Description of Divorce in Spokane, Washington, by *H. Ashley Weeks*; Lessing and Hawkesworth, by *Paul P. Kies*; Laws of Washington Relating to Children, by *Mae Mark Nalder* and *Marjorie J. Smith.* 208 pp. Price.....$1.60